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STANDARD PRACTICE IN PERSONNEL WORK

EUGENE J. BENGE
THE ATLANTIC REFINING COMPANY;
FORMERLY FELLOW IN PERSONNEL RESEARCH,
CARNEGIE INSTITUTE OF TECHNOLOGY

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TO MY PARENTS

PREFACE

Personnel work in industry no longer needs justification. The "human element" is being accorded a proper recognition. Employment, training, health supervision and maintenance have sprung up sporadically. Too seldom has it been realized that all have a common purpose.

This book attempts merely to bring together successful personnel practice, and to point out the possibilities in centralization of activities. It has not in any sense attempted a philosophy of labor, or even a history of personnel development. The author has attempted to preserve an impartiality of viewpoint, not by evading frank statement of conditions, but rather by presenting the pros and cons on each side of the labor question. He holds no brief for either side.

The author wishes to take this opportunity to express his appreciation to whose who have lent such splendid cooperation. He is indebted to various members of the Bureau of Personnel Research for no small amount of the material contained in this book. Thanks are extended to Mr. L. P. Alford, editor of Industrial Management, and to Mr. L. I. Thomas, managing editor of Factory, for permission to reprint material which has appeared in those magazines. The War Department has kindly consented to the publication of official personnel data. Mr. Kendall Weisiger, personnel manager of the Southern Bell Telephone Company, and Lt. Col. D. W. K. Peacock, personnel manager of the Philadelphia Company, have given valuable suggestions and have supplied several of the records used. Finally, he wishes to thank

Mr. Richard S. Uhrbrock, of Carnegie Institute of Technology, for his timely suggestions throughout.

The author considers it a privilege, indeed, that the opportunity has been his to make even a small contribution toward a better industrial relationship of man to man.

EUGENE J. BENGE

Bureau of Personnel Research,
Carnegie Institute of Technology.
June, 1920.

FOREWORD

The last ten years have seen a notable growth in what is known as the employment management movement. That growth has shown itself in the increased interest and attention given to the subject of industrial relations, in the accumulated experience of managers in meeting labor problems, and in the developments in employment technique. The process of checking up and weighing experience with projects of various sorts has tended to make the approach towards labor problems more scientific and practical.

Progress in the technical side of employment management has made possible the removal of many sources of friction. Modern management has learned that the first step in successful employment work is the functionalized employment department. When the concern becomes big enough, that department takes a definite, important place as a unit in a larger organization which handles all problems of personnel relationship.

The administration of the employment department involves a technique which must be thorough, reasonable, and satisfactory in helping obtain the facts upon which successful management must rest, and which facts must guide the formulation of an intelligent labor policy for the concern. The technique of employment administration is still in its experimental stages. We need a standard practice based on organized observation and analysis; we need clearer definition of terms used in practice; employment department statistics must be reported adequately and uniformly so as to make exchange of information more effective.

It is not only in the more formal phases of employment work that we need uniform practice; we must have well-formulated methods of dealing with the working force. But such methods cannot and should not be too rigid. There are too many individual factors that present themselves. Although each concern will find problems of procedure peculiar to itself and will have to meet its own needs, comparison of methods in these concerns with methods used in other concerns will undoubtedly enable one to find a common denominator among all procedure. That common denominator should serve as the basis for a standard practice.

The methods and machinery of personnel and employment practice must ever be flexible to meet changing conditions; they must, above all, be simple. Over organization or over-emphasis of "system" defeats the very purpose of organization. The best practice will be that which enables the personnel worker to bring out the facts in industrial relations most forcefully and make them tell the story tersely and truthfully. Such facts must enable management and the rank and file to come together to solve problems common to both.

Back of the machinery of practice must be the right point of view on the part of management. It is that point of view which gives life to the organization, which stands out above the mechanics of procedure, and which underlies work in promoting sound industrial relations.

Take the matter of job tests as an example. To use tests merely to find out whom to reject or discharge is to destroy the greater usefulness of such tests. The greater function of tests is not only to discover capacity and ability and place it where it is best fitted to do the work in hand, but to enable the management to develop the possibilities in all who are tested so that society itself as well as industry may gain by the increased efficiency of wage earners.

One must be careful, however, in appraising tests, particularly mental tests. The true scientist will never generalize from a few cases; he will be cautious and conservative in interpreting his findings. He will not allow tests to be the sole means of judging men. The judgment of the employment executive is a composite of many factors. The executive will lay most stress on the objective facts in the situation; for those are the most reliable. Psychology has not yet reached the point where its applications to employment practice have received the evaluation of long critical experience, although encouraging progress has been made in this direction since the war.

So it is in the matter of employee representation. While some sort of organized procedure must exist to make representation effective, the emphasis must come on the spirit in which the plan is administered. Right relations rest on mutual confidence, and on nothing else.

This book gives detailed accounts of successful methods used in personnel and employment departments. It also discussess new steps in practice. Such new experiments point the way to the practice of the future, and to the needed modifications in such practice. The author has rendered a real service in giving us a guide book which will prove of much practical value.

DANIEL BLOOMFIELD.

Boston, September 18, 1920.

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STANDARD PRACTICE IN PERSONNEL WORK

INTRODUCTION

When Solomon built the Great Temple, he designated three classes of workers whom we to-day would call laborers, mechanics, and foremen. This early architectural feat represented one of the first great projects in which each citizen contributed his share for the ultimate good of all. It furthermore represented a definite recognition of the principle of the division of labor applied to mass production.

Like all permanent social changes, the division of labor throughout the ages has been a gradual growth. Chief, judge, priest, warrior, mother, slave—each had a specialized duty to perform. But it has only been within the past half century that the principle has been *expressed*, and consciously applied to our economic life.

Under the age of handicraft, every man was a self-sufficient producer for all his needs. In our own country, the early settler was his own builder, farmer, hunter and manufacturer. But the principle of division of labor affected even the self-sufficient producer, so that certain duties were delegated to the cavewife, the squaw, the housewife, and certain other duties developed upon the growing children. Thus, growing out of the age of handicraft there arose the age of domestic production, wherein the household was the self-sufficient unit which supplied all needs. Because the division of duties meant increased supply, and because others would buy or barter for the surplus production of the household, the domestic system of manufacture arose. This system is perhaps best exemplified by the spinning trade in England prior to the introduction of machinery in any form: raw materials were supplied to the households to be spun, and when spun, taken away into the channels of commerce.

The introduction of machinery brought about what is known as the "Industrial Revolution," a period of adjustment which inflicted great distress to European workers, who adapted themselves but slowly to the new demands. The main characteristics of the era of the industrial revolution were the mechanical inventions which brought it about and furthered it, the use of coal and iron, the establishment of factories, the accumulation of wealth and the dominance of capital as a more important factor than labor.

Under the guild handicraft system, the skilled craftsman was his own designer and foreman. Machinery and the accompanying factory system rapidly changed all this. Planning and doing were gradually separated. At first the owners of the factories which housed the fearsome machines were the planners who promised when work would be done and personally supervised the shaping of the raw material into the finished product. The proper tools and the place to work were supplied the worker. However, the personal relationships between the owner and the worker were still maintained—the owner was just plain Tom and the worker plain Bill.

But when the owner found that he had too many things to do, and delegated someone to see that the work was carried out properly, management in its modern sense came into existence. The gap between Tom and Bill widened; the new worker coming into the plant never knew Tom as such, but rather as Mr. Brown, the owner. The manager or foreman became the personification of the business: the employer was good if the foreman was good.

The first era under factory production was marked by the attention of management to tools and machines. The current economic theory regarded man as a kind of animal whose greatest aim in life was centered about the pay envelope. Fierce competition and reckless price cutting meant that costs must be reduced somewhere, so the burden was thrust upon the worker. Particularly was this true of women and children, who were by nature less resistant to exploitation. It is almost gruesome to read that in 1802 a law was passed in England to prevent the exploitation of children, which set 12 hours as the maximum working day and 9 years of age as the lowest legal limit for children working in factories. Nine years!

The shifting of the attention of management from materials to methods marks the transition from the first stage of factory production to the second. Systematized management, with a line and staff control was certainly a step in the right direction. The advantages of the specialist were recognized, and the findings of science came into favor. With the demand for better system, and more accurate knowledge of materials, there was ushered in the whole movement known as scientific management and efficiency.

Taylor, the dominant figure in the whole movement, defined scientific management in the following remarkable statement:

"In its essence, scientific management involves a complete mental revolution on the part of the workingmen engaged in any particular establishment or industry—a complete mental revolution on the part of these men as to their duties toward their work, toward their fellow men, and toward their employers. And it involves the equally complete mental revolution on the part of those on the management's side—the foreman, the superintendent, the owner of the business, the board of directors—a complete mental revolution on their part as to their duties toward their fellow workers in the management, toward their workmen, and toward all of their daily problems. And without this complete mental revolution on both sides scientific management does not exist."

Unfortunately the Taylor and similar systems too often regarded men as seekers of pay *only,* and the industrial enterprise as existing for the stockholders only. No man, no matter how simple his mentality, is satisfied with high wages alone; no industry exists merely for the stockholders or, indeed, even primarily for them.

Meanwhile the exploitation of labor had continued unabated. Since labor was regarded as purely a commodity, and since there were more men than jobs, the cheapest price, or wage, obtained. Working conditions which were good enough for the storage of other materials were surely good enough for human material as well. Indeed, far more attention was paid to the careful preservation of expensive materials than to that of the seemingly inexpensive workman. Another man could be obtained by a simple crook of the finger at the gate—but new material meant an outlay of money. If the foreman had a vile tongue and a brawny fist, he could shape the human material for the needs of the business. If profits were large, management and the stockholders participated—the workman had agreed to a fixed sum for his day's work. He was entitled to that and nothing more.

Consider the workman. As a handicraft worker he contributes eight distinct factors to production. He secures the raw material and distributes the finished product. His own tools are used, and he himself selects the place of work. He devises his own methods and controls the speed of doing the work. Finally, he contributes his skill and the time to do the work. The accompanying chart (Fig. 1) shows how these have been taken from him, pair by pair, first by the domestic system of production, next by the introduction of the factory system, and finally, by the methods of scientific management. And each encroachment removed prerogatives that were essentially more intellectual, more of the self, than were the preceding. Added to these there were the many injustices of treatment which he had to suffer in silence.

Class consciousness is one of those beautifully indefinite terms by which we often attempt to explain something we don't fully understand. But this we do know about it: any group of people who have common interests extending over a long period of time will develop it, whatever it may be.

Under the oppression which was put upon the worker by an autocratic, inefficient management, the former had four methods of recourse. He could be driven into actual revolution, could organize into trades unions, or a workingmen's party, or could assume a direct part in management. The trades union was the least drastic, and the one which offered more immediate relief. At first these unions were merely local affairs, although not without power in the various communities, as (in 1827) the general strike in Philadelphia for a ten hour working day evinced. If the individual was powerless to bargain with unheeding, unscrupulous capital, then would he join hands with others and secure the weight of the entire group.

Class consciousness. Whatever it is, wherever it was hidden, it came to the forefront, and developed. The local unions became national unions, the national unions combined into powerful federations. Allied trades elected joint councils, so that each might help the other when needed, by sympathetic strikes. A basis of common in-

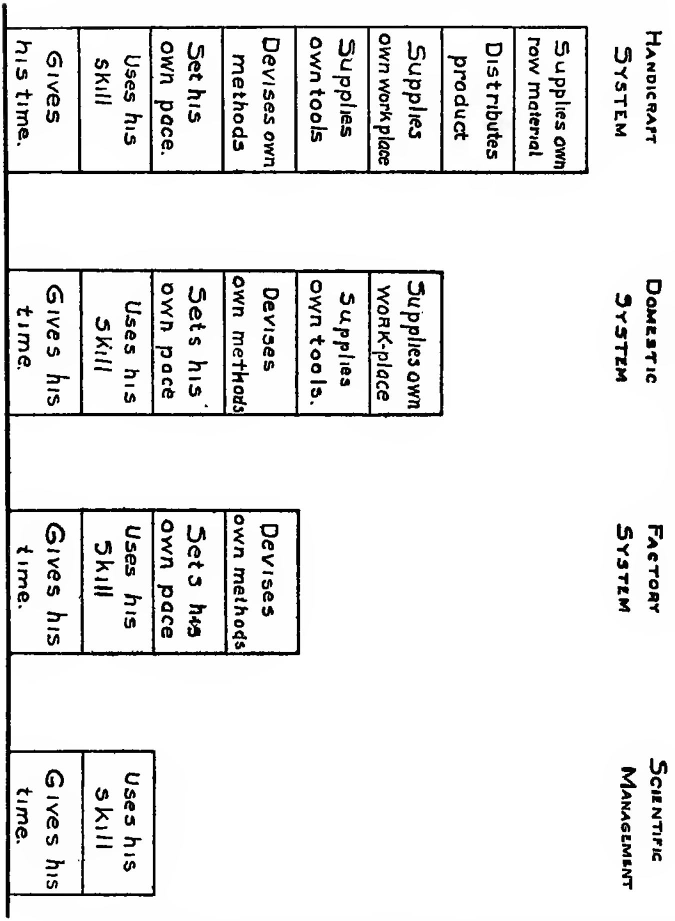

Figure 1

SHARE OF THE WORKER IN PRODUCTION.

Various Industrial Eras

terest was adopted for all unions. This basis, known as the "common rule" consists of the regulation of the standard rate of wage, the length of the working day, healthful conditions and the practice of collective bargaining.

It would be an optimist indeed who would state that the period of the strike and lockout belongs to the past. To many it does seem that the same Social Mind which condemned exploitation of labor is casting frowning inquiry upon the persistent threat of strikes and tie-ups the country over. Arbitration before impartial judges is being regarded with distinct favor, as preventing loss to worker, industry and society alike. Thus between January 1, 1916 and October 25, 1917 the Department of Labor alone adjusted 323 labor comtroversies, involving hundreds of thousands of workers. The pioneer Kansas Court of Industrial Relations is being watched with considerable interest the country over.

It is safe to believe that we are now living in a nascent era of industrial changes whose main characteristic when crystallized will be the attention to the human relations of man to man. A new profession has arisen. Out of the nebula of efficiency, paternalism, exploitation, and strikes which have hitherto floated like a wreath of good and evil over an enterprise, there has been formed the new profession of industrial relations, whose aim is to educate management and men alike to understand and to help each other. Beginning, as it did, with a realization of the evils and losses due to bad employment policies, this new profession has gradually broadened until it is now considered by many to be the most important single factor in management.

The realization of the waste due to promiscuous hiring and firing, coupled with the acceptance of the principle of functionalization, led to the establishment of the centralized employment department. This department had a very close analogy in the purchasing department which, not many years previous, had undergone a somewhat similar evolution—the realization of the waste in careless purchasing was followed by the centralization of the function. Indeed, the actual routine of the two departments has much in common: the requisition, the securing of the materials according to specification and the change when the material secured does not live up to specification. We are coming to realize that labor maintenance is just as important, if not much more so, than the maintenance of equipment.

Careful selection of men was at first considered the primary and only duty of the employment department. The theory was that men are created for certain jobs, and all the employment division had to do was to find the right man for each job. We still hear of the "square peg in the square hole", although we are coming to discard the belief that any man is best fitted for any *one* job. Centralizing of the employment function involved removing that power from the foremen who hitherto had abused it so badly. But such removal resulted not in the much needed cooperation, but in the antagonism of foremen. The employment department soon discovered that it must develop sources of labor supply, a function which has been very poorly done in most cases and one which is little understood. Careful interview of the applicant and careful records upon employment completed the functions of the employment department as at first conceived.

But it was soon realized that proper selection was not sufficient, for often men could not be found for certain positions, and inexperienced men had to be trained quickly. Accordingly, a training function was taken under the sheltering wing of the employment department and the employment director assumed the responsibility of a leader in education and training.

Supervision of health with its necessary attention to the individual worker came next to be regarded as a paying investment, and quickly turned the spotlight upon bad working conditions. The whole problem of the careful follow-up of each workman with necessary transfer or deserved promotion naturally fell upon the growing employment department which in many instances was no longer called merely the employment department. Department of human relations, department of industrial relations, personnel department and other equally comprehensive titles came to be accepted as more definitive of the actual work performed.

In most instances the personnel department had not, and has not, succeeded in establishing real human touch with each worker. The foreman has been excluded entirely, yet it is he who is in intimate contact with the workman day after day. The personnel department enters usually at *issues* only. At present there is a tendency to diversify the activities of the personnel department so that every single worker in one way or another will come under its influence. In many cases this is being done by first training foremen in the art of handling men and then handing back to them much of the "management" function which the employment department took from them, retaining, of course, the centralized administrative functions of the personnel department. In other concerns representatives of the personnel department who are thoroughly acquainted with production processes are being placed directly in the shops and offices, and there carry on their work.

The latest step in the activities of the personnel department has been the cooperation with employees, associations in their participation in management. At least two hundred and fifty concerns in the country are at present trying this experiment. Under this arrangement various committees of the workers themselves become means of establishing close human relations, and of communicating the real thoughts and feelings of workers through the personnel manager to the management.

The next step probably will be the addition of a division of personnel research and the concomitant introduction of scientific methods into personnel practice. While in a few sporadic cases the division of personnel research is an actuality, it will probably be many, many years before it becomes an accepted branch of personnel work.

While the employment department had been widening its scope in the industrial field, the science of psychology had felt the demand for practical applications and had begun to develop a definite laboratory technique of applied psychology. A science of statistical procedure which is highly specialized and adapted for the most part from the field of biometry has been developed. Accurate tests of various mental processes have been devised and standardized. In order to measure any one element of intelligence it is necessary to eliminate from the result the part for which other elements are responsible. Statistical procedure gives a method of doing this with some degree of accuracy.

The recent war gave great impetus to personnel work. The entire field was necessarily advanced far beyond the point it normally would have attained within, perhaps, a decade. The mushroom munition plants had to produce quickly, and in order to produce at all, had to have workers. Among hundreds of other "wildcat" schemes, the newfangled centralized employment department was tried out—and made good.

The employment work of the shipyards was somewhat less haphazard than that of munitions, for the yards were all under one central authority, the U. S. Shipping Board. Well prepared bulletins on employment problems were compiled and sent out to those actively engaged in the formation of employment departments in the shipyards. Steps were taken to include the problems of maintenance and human relations as well as that of selection. Training was given careful consideration, much literature was issued on the subject, and comprehensive training programs were laid out. Despite these, turnover was undoubtedly high, and the personal relationships were not adequately cared for.

The personnel work in the Army was undoubtedly the biggest single contribution to personnel practice which the recent war period made. At its inception this work was simply an attempt to rate candidates for officers' training camps, using a system similar to that which Dr. W. D. Scott had been using for the rating of salesmen. But the big possibilities of "fitting the right man into the right place in the Army" were quickly realized and soon the personnel problem had drawn into its net most of the prominent employment experts and psychologists of the country. The use of group tests of intelligence for proper placement of men was tried out at four camps, and found to be successful. It was quickly realized that the right man could not be fitted into the right place until the requirements of that right place were definitely known, so a job analysis of the entire Army was undertaken, no mean task in itself. The demand for tests of skill as well as for those of intelligence came to be felt, and the trade test division was organized. The personnel system of classification was extended to those units which had already gone overseas. Finally, when the war was over, the personnel machinery was reversed and aided in the discharge and placement of men into civilian positions. The work of the personnel division of the Army may be summed up in three statements: 3,600,000 men were classified; 1,700,000 men were given mental tests; and 250,000 men were given trade tests.

At present, in the field of industrial personnel there is a definite need for standardization of terms. For the purpose of this book we shall adopt a definite terminology. It is not by any means believed that this terminology is necessarily the best for all purposes.

The person in charge of all the personnel relations throughout the plant will be called the personnel manager, and the department under his supervision will be called the personnel department. The terms "industrial relations" and "human relations" have not been adopted because, in the first place, they are somewhat cumbersome and, secondly, they have to many an unsavory connotation.

The personnel department will be divided somewhat arbitrarily into five divisions, with a director over each division. In actual practice it is found impossible usually for one man to supervise the various activities necessary to the employing and retaining processes. Accordingly we shall adopt the following five divisions:

1. The employment division, under the direction of the employment director. Throughout we shall regard the employment director much in the sense of a purchasing agent who receives his requisitions and scientifically secures the material according to specifications. This sense means a much narrower scope than the ordinary use of the term, employment manager. A majority of present day "employment managers" are in reality personnel managers.

2. The educational division, or division of education and training will be the second main division of the personnel department. At its head will be the educational director, whose duties are somewhat obvious.

3. The medical or health division comprises the third main division of the personnel department, and is under the supervision of the medical director.

4. The maintenance division has to do with all relations with men after they have been placed, not taken care of by other divisions. The director of maintenance attends to cases of transfer, promotion, grievances and the like.

5. Finally, the research division, which is advisory only, and which is supervised by a director of research.

That the present is a period of changing ideas toward the personnel problem is undoubted. The accepted practice and belief of to-day will be scrapped to-morrow, or engulfed in a trend which is far wider. Amid this onward sweep or change it seems possible to note four fairly distinct tendencies.

The acceptance of a functionalized personnel organization is practically an accomplished fact. But a functionalized personnel organization implies highly paid *specialists,* and this fact many managements fail to appreciate. It is realized, of course, that real personnel specialists are few and far between just at present.

The second main tendency of the present day is the realization of the importance of the conservation or economy of man power. A definite knowledge of the physical and mental environment of the worklife of each worker and a definite knowledge of the duties and requirements of each job supply the basis for a proper economy of personnel. But although these bases can be afforded in great part by the job analysis, there must also be the certainty that each worker will be carefully selected for the position, that his abilities will be properly utilized when he has been selected, that his training will be best adapted to the needs of the organization, that he is given every opportunity to grow and to deserve promotion, and finally, that he is given the desire and ambition to work well and to cooperate heartily. The realization of these needs is far more simple than the actual carrying out of the implications.

A third important tendency, and probably the most recent, is the attempt to develop the attitude of the worker toward his work. Supervision is becoming positive rather than negative; suggestions are constructive rather than destructive. Whether the worker can state it specifically or not, we are coming more and more to realize that every man demands more out of his work than a weekly envelope. There are many springs of action in the human mechanism, and appeals should be made to as many of these as possible. Even of greater importance to the employer than the ability to work is the *desire* to work, but both can be inculcated.

Finally, we are coming to understand that a broad social viewpoint is absolutely essential in all personnel relations. The employer who heedlessly cuts rates is doing incalculable harm not only to himself but to the community. The concern which recklessly hires and fires, the sweat shop which exploits women and children, the plant which permits unsafe and unsanitary working conditions to exist and the employer who manages his employees by craft are all social menaces and cannot be too strongly condemned. Industry exists for Society, not Society for industry. Treating workmen on a man-to-man basis, appreciating that men have hearts as well as hands, is not sentimentalism. It is not only the proper business procedure but is also the only basis which

Society should permit. Judge Gary realized this fact when he said: "There is no way of permanently settling any great question involving the welfare of humankind, except on the basis of right and justice."

The present trends of personnel development would seem, then, to be included under the four headings:

1. A functionalized personnel organization.
2. A knowledge of working conditions and requirements.
3. Careful selection and follow-up.
4. A broad social viewpoint.

Whether he possesses the technique of the personnel field or not, it is imperative that the executive who takes it upon himself to handle the human relations of his business have a proper viewpoint. In personnel work this viewpoint can no longer be merely the placing of the square peg in the square hole and the round peg in the round hole. Rather must it be the treatment of the worker in his work, or—as Dr. Beardsley Ruml has suggested writing it, of the "worker-in-his-work." Not always the man best fitted for the job succeeds, for there are too many other factors which may enter in. The worklife must be regarded as an *actual life* which takes birth when the employee starts in, and which dies when he leaves the position. This is in conformity with facts, for on two men ever fill the same job in the same way, nor can they be handled by exactly the same methods. The job reacts upon the worker, and the worker molds the job. And in turn the relationship which arises between the job and the worker, the "worklife", reacts as a unity upon the company as a whole, and is reacted upon. The problem of personnel management is primarily an individual problem, in which the worklife must be properly created by adequate methods of selection, must be carefully nurtured by training, supervision and encouragement, and finally, must be allowed opportunity to grow, or else it will become repressed and stunted, and finally die.

Such a point of view is perhaps radical, but it contains all the nuclei of modern personnel tendencies.

CHAPTER I

THE PERSONNEL AUDIT

It is an accepted business principle that planning shall precede performance. But preliminary to intelligent planning, it is first necessary to discover existent conditions. Before attempting to lay down a program, the entire personnel situation must be reviewed carefully. The personnel audit is a means of securing this end.

We might define the personnel audit as an analysis of those conditions which affect the worker-in-his-work and of the relations between management and men. Community study, job analysis, labor turnover, management policies, and workers' attitude, coupled with statistical presentation of labor conditions, usually reveal startling, undeniable facts. The personnel audit is often known under other titles such as industrial audit, labor audit, personnel inventory, etc. Just as the results of a stock inventory or a financial audit must be expressed in permanent form, so should the results of the personnel audit be put down in record form, as well as written up in a report with recommendations.

The nature of the personnel audit varies with the extent to which personnel management has been developed in the particular plant. It is obvious that its purpose must be different in a concern which has no personnel organization than in one which has a well developed personnel department. In either case, however, the audit aims among other purposes to discover those physical and mental conditions which produce discontentment, and in final analysis, those human causes which are retarding production. Management is thereby supplied with much food for thought and discussion, and constructive basis for future policies. The individual worker benefits also, for causes of friction are removed and greater opportunities of advancement opened as a result of the whole inquiry.

The personnel audit is just as necessary as any audit. It should periodically check up conditions of personnel, and note improvements or failures to fulfil policies which have been previously laid down. Management is complacent when profits are large, regardless of inefficiency of machines or men. Often good policies of handling men have fallen into disuse because their continuance was not made the direct responsibility of some one executive. When the personnel audit is made in a concern which does not already have a personnel department, the need for such a department usually becomes obvious. The results of the audit furnish the management with a solid foundation of fact on which to base improvements in method, or sudden expansions of the working force.

Before the actual work of the audit is undertaken there are various important preliminary considerations. It must be decided whether the auditor shall be chosen from within the plant, or whether he shall be selected from some outside source. Whichever decision is made, it is certain that the auditor should be a man of considerable tact, agreeableness and human sympathy, in addition to the professional qualities required. If the personnel department is being installed initially, the prospective personnel manager will secure invaluable information from either directing the audit or from active participation in it. Where there already is a well organized department the personnel audit logically falls under the work of the research division. An impartial investigator chosen from the outside will usually bring to bear a fresh mind upon old problems. In any case, the auditor must sell his proposition slowly to management and men alike. The former must be absolutely convinced of the necessity of the personnel audit and must be willing to place at the auditor's disposal all possible records and other facilities for the uncovering of the information desired. The workers must be convinced that the audit will result in benefit to them, and that it is not simply a method of spying.

The various sources to which the auditor can turn for information will naturally vary greatly in different concerns. Before he starts any work at all, it is essential that he understand thoroughly the organization of the company, its history and development, its (intended) policies and its relation to the consumer. He is then in a position to talk with minor executives and particularly with those who have been directly handling the working force, such as foremen and department heads. The records of the accounting, payroll, planning and legal departments will often throw considerable impartial evidence upon such subjects as pay, hours of work, absence, accidents and strikes. Records of Directors' actions, constitutions and minutes of various employee associations, collective bargaining agreements and similar documentary evidence will supply information of a somewhat different nature. Finally, the expression of opinion from candid workers constitutes the most important single source of personnel analysis, although such opinions must be very carefully evaluated.

One of the first considerations in preparing for the personnel audit is the selection of the items which shall be covered. In general, it has been found best to discover what the existing condition is, how it affects the efficiency and contentment of the worker-in-his-work, why the condition exists, and finally how it can be changed. As far as possible, the items should be objective, and should impartially point to obvious conclusions. For instance, the recent audit of an insurance company showed that a certain record, from which eight other records were made, shifted back and forth between two departments simply because an individual had been transferred from one department to the other and had continued doing part of the work of the first department. Thereupon the remedy became obvious. The following rather comprehensive list is offered as suggestive of items which might be included in a typical personnel audit.

ITEMS IN A TYPICAL PERSONNEL AUDIT

I. Chart of Organization.

II. Management Policies.
    A. Form of management.
    B. Hours of work.
    C. Previous labor troubles.
    D. Employers' associations.
        1. Blacklisting, etc.
    E. Compensation.

III. Summarized Personnel Data.
    A. Number of workers by
        1. Sex.
        2. Race.
        3. Nationality.
        4. Religion.
        5. Age.
        6. Department.
        7. Kind of work.
        8. Length of service.

- B. Average, maximum and minimum wage by
  - 1. Sex.
  - 2. Age.
  - 3. Department.
  - 4. Kind of work.
  - 5. Length of service.

IV. Relation of Employees to Employer.
- A. Employees' associations.
  - 1. Scope.
  - 2. Limits.
  - 3. Effectiveness.
- B. Collective bargaining.
- C. Arbitration.
- D. Trade unionism.

V. Governmental Control.
- A. Taxation.
  - 1. Tariff.
- B. Regulation.
- C. Labor legislation.
- D. Court decisions.

VI. Personnel Department.
- A. Employment division.
  - 1. Sources of supply.
  - 2. Interview.
  - 3. Mental tests.
  - 4. Trade tests.
  - 5. Medical examination.
  - 6. Placement.
  - 7. Employment records.
- B. Education and training division.
  - 1. Method of instruction.
  - 2. Vestibule schools.
  - 3. Shop schools.

        4. Foreman training
        5. Americanization.
        6. Content of courses.
        7. Attendance at classes.
        8. Plant paper.
        9. Training records.
    C. Health division.
        1. Periodic physical examination.
        2. Dental and optical examinations.
        3. Sanitation.
        4. Safety.
        5. Mutual benefit association.
        6. Health records.
    D. Maintenance division.
        1. Promotion.
        2. Transfer.
        3. Grievances.
        4. Suggestion.
        5. Discipline.
        6. Attendance.
        7. Lateness.
        8. Efficiency records.
        9. Efficiency ratings.
        10. Service and social work.
        11. Recreation.
        12. Maintenance records.
    E. Research division.
        1. Staff.
        2. Equipment.
        3. Scope and limits.

VII. Job Analysis.
    A. Duties.
    B. Nature and conditions of work.
    C. Opportunities.

- D. Man requirements.
- E. Personnel specifications.

VIII. Study of Community.
- A. Supply of workers.
- B. Community facilities.
  - 1. Housing.
  - 2. Transportation.
  - 3. Business.
  - 4. Education.
  - 5. Recreation.
- C. Cost of living
  - 1. Food.
  - 2. Clothing.
  - 3. Housing.
  - 4. Sundries.

IX. Labor Turnover.
- A. Tabulation of turnover, and length of employment by
  - 1. Age.
  - 2. Sex.
  - 3. Nationality.
  - 4. Department.
  - 5. Foremen.
  - 6. Kind of work—skill.
  - 7. Causes of termination.

In securing the information which has been settled upon, a careful charting of the organization is necessary. In making the organization chart, direct lines of responsibility should be indicated by complete, heavy lines, and indirect (inspection, supervision, or advisory) by dotted lines. Such organization chart should be carried down to narrow subdivision, and to the individual worker if possible. This last step will be found helpful in the job analysis.

The consideration of managerial policies is a task which requires great tact on the part of the auditor, for not only must he set forth such rather impartial factors as the form of management, lines of responsibility, etc., but he must also boldly face more tender spots such as previous labor troubles, employers' associations and blacklisting, conflicts of authority, employee representation, hours of labor, and methods of pay. In connection with the study of compensation, it is important that the auditor differentiate discontent due to the amount of pay and that due to the method of payment.

Each item to be considered in the personnel audit will often involve a detailed study which is out of the scope of the auditor. In such cases he can but recommend the steps necessary to the solution. The following selection, taken from a report to a concern which has about five thousand employees, is typical.

The Length of the Working Day

"There is a possibility that the working day is too long in order to secure the best results from the worker, to permit elimination of all fatigue by the succeeding day, and to promote a contented spirit. The plant is rather inaccessible, and although the company has tried to secure the best of transportation facilities for its men, yet considerable time must be spent on trolleys.

"It would be interesting to make a study of points similar to the following. What time does the average worker in the plant have to arise? Approximately how many blocks away does he live? How long does it take him to get here, etc? A map might readily be made, indicating by pins the density of the working population of the X Company throughout the city. In making such a map, it would not be necessary to consider all cases—if every tenth name on the payroll were to be plotted on the map, the selection would be representative of the entire group.

"The employer has, certainly, some responsibility for the health of the worker. If in addition to a nine and a half hour day the employee is spending an additional hour and a half on the cars, then almost half his day is spent in the interest of his employer.

"In addition to the information noted above, an interesting experiment might be performed, particularly during the worst of the winter months when the force is fairly stable, when darkness shrouds the early morning, and when the weather is inclement. Such experiment is as follows: Weigh all employees in departments which now start at seven-thirty. Permit them to start at eight, without decrease of wages, but with the understanding that the arrangement is merely for the winter. At the end of ten weeks weigh the same group of employees, eliminating from the statistical work those not working during the entire ten weeks. Calculate the average weight in both cases, and note decrease or increase. Compare this with the average weights of employees who have been coming in later right along, and with fluctuations of the normal population during this same period. Where possible, compare production records for the period. Secure comments from intelligent men. On the basis of these factors, it might be (has been, in other companies) found that with shortened hours, production has increased, morale has been improved, labor turnover cut down, and beneficial results obtained throughout."

In order that the auditor may secure a bird's-eye view of the organization it is important that he obtain various summarized facts about the company as a whole. These facts should show the number of workers by sex, nationality, by department and kind of work, as well as the averages relating to age, wages and length of service.

In attempting to show the relations of employees to employer the auditor should state such concrete facts as are self-evident, as well as the more intangible points which have to do with attitude, contentment and causes of unrest. If there is an employees' association its actual scope and limits can very well be set forth, in conjunction with a statement of the seeming effectiveness of the association. If collective bargaining is in vogue its practice and results should be outlined. The influence of trade unions should be carefully studied, and methods of arbitration, if not already in existence, should be suggested.

Although unseen, governmental control is often a very powerful factor in the personnel situation. Such control may take the form of various methods of taxation or tariff inspection, or even of direct regulation. Labor legislation and court decisions, whether applicable to labor as a whole or to the particular industry under consideration, should be analyzed carefully.

Where there is already a personnel department in existence, the personnel auditor has the double task of securing cooperation and of making constructive criticism. The various aspects of the employment process and the methods and adequacy of training must be given careful consideration. Supervision of health, attendance, provision for promotion, transfer, suggestions and the like, adequate recreational facilities and, finally, various forms of service to employees are all factors which should come under the scope of a well organized personnel department, and should therefore receive the attention of the personnel auditor.

Job analysis is such an important part of the personnel audit that it will be treated in a separate chapter. Akin to the job analysis in importance and scope are studies of the community which supplies the workers, and of the labor turnover within the plant, both of which will be considered in greater detail later. It is the duty of the personnel auditor to relate job analysis, community study, labor turnover and managerial policies, directly to production. If he fails to do this, he is attempting to drive the engine of managerial action with very loose belting indeed.

Frequently the final report will be a rather ponderous document from ten to fifty thousand words in length. As far as possible facts should be stated in summarized form, either by the use of percentages, averages, summary tables, or by charts and other graphic methods. In the final report there may well be compared with the organization chart made initially a revised chart on which duties and responsibilities are sharply defined, lines of promotion clearly indicated, and jobs of equal value and pay placed on horizontal rank. The two comparative charts (Figs. 2 and 3) illustrate how simply and effectively reorganization can be effected.

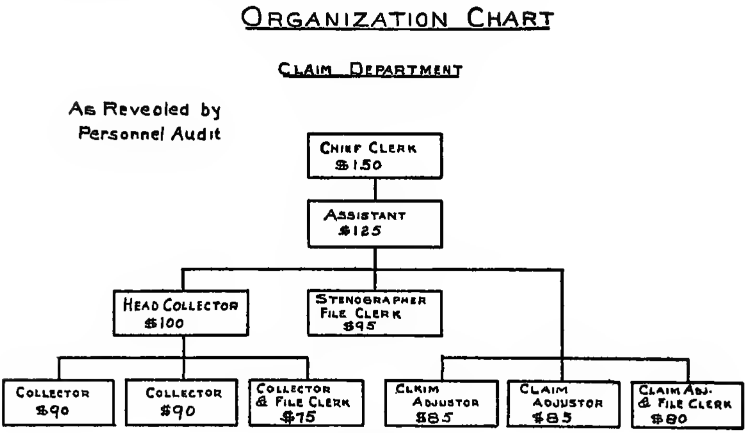

Figure 2

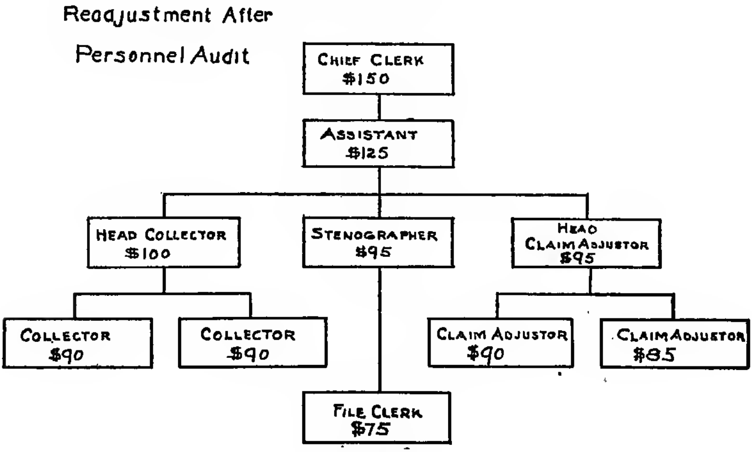

Figure 3

The form of the report should be such that any particular item can be discovered with a minimum of effort. This result may be accomplished either by an elaborate index or by a detailed table of contents. In the body of the report, after each condition has been set forth, recommended changes should immediately follow. Particularly is this true of that section which treats of lines of promotion and wage adjustment. Employees should be grouped according to their value to the company, and maximum and minimum wage rates assigned for each group. In order not to discourage expert workers in any given group it is usually better that the maximum rate for each group be slightly larger than the minimum rate for the next higher group. In connection with sweeping wage adjustments, there can usually be shown comparative tables which indicate the present annual wage cost by departments or other subdivisions, and the probable annual wage cost if the auditor's recommendations are carried out. The following simple illustrations will serve to show the general nature of such comparative tables.

DEPARTMENT A

	Present			Future		In-
Title	No.	Av.	Total	Av.	Total	crease
Stenographer......	48	$23.00	$1,104	$25.00	$1,200	$96.00
Bill Clerk.........	17	15.00	255	18.00	306	51.00

Even if the auditor's recommendations for wage adjustments are not carried out to the letter, his findings will give a basis on which to pro-rate any sum which may be assigned for the purposes of wage adjustment.

If an organization has offices or plants scattered throughout the country, it is usually impossible to set salaries and wage rates from the home office. Different schedules are necessary in different sections. A personnel audit should therefore be made of each plant. In carrying this out it is important that the auditor should not simply consider himself as a representative of the home office sent out to do a particular job, but rather that he should sell his work in the branch plant just as carefully as in the home plant.

In presenting the final report, the auditor must be both teacher and salesman. As a teacher, he must point out existent conditions which are wrong, and suggest remedies. As a salesman he must not only convince the powers-that-be of the correctness of his remedial measures, but he must also supply the executive staff with the spurs to action that will cause those measures to be properly carried out. In order to do this it may be necessary for the auditor to make a concise summary of the detailed report, which summary shall contain suggested remedies only. Then if any point is called into question, he can refer the executive to the larger report. In either event, the final report should give a summary of the most important changes recommended. It is usually best for the auditor to evaluate the importance of his own findings and to suggest the sequence of carrying out his own recommendations. As a salesman, the auditor should furthermore recognize the value of the personal element. Conferences with various groups of executives will always accomplish more than an impartial typewritten report, which may be cursorily examined and very carefully filed.

Carried to full fruition, the personnel audit accomplishes many ends. It indicates in black and white the strong and weak points of the organization in its personnel relation. Executives are made to realize the diversity and scope of the labor problem; the impossibility of some novel panacea becomes evident. Wise policies that have fallen into disuse are revised, and unwise policies discarded. The attention of management is focused on the vulnerable spots in the handling of the force. Finally, the personnel audit supplies a foundation for outlining an adequate personnel program which will be not only remedial for present conditions, but will also be constructive for future developments.

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CHAPTER II

JOB ANALYSIS

The job analysis has a definite relation to the personnel audit and is an integral part of it. But whereas the personnel auditor surveys the enterprise as a whole in its relations to the worker, the job analyst attempts to study each individual job. The error is often made of believing that a job analysis is a personnel audit. The two are not synonymous.

There are many factors which have brought about a realization of the necessity for job analysis. For one thing, the worker is no longer regarded as merely "a square peg" to be fitted into "a square hole." It is realized that the work which a man does has a definite reaction upon him, and that he in turn has a definite reaction upon the job. Again, it has been recognized that all men are not by any means alike. What the psychologist calls individual differences simply means that we cannot fit *any* man into *any* job. We must know what the job is like before we can hope properly to fit a man into it. Job analysis supplies information not only for the employment process, but also for use in training, for the establishment of definite lines of promotion, for the gradation of various jobs within the organization, and for the delineation of definite duties and responsibilities.

A further realization of the inadequacy of methods of measuring production has made it imperative that we know more about the job. The study of turnover has brought about a realization of the general loss due to maladjustment of the worker to his work. In conjunction with the shortage of workers and the demands of organized labor, the employer has been forced to seek definite knowledge concerning each job in his organization. We might sum up the value of the entire personnel audit in a single statement, which is almost axiomatic, that maximum production is not possible without a well adjusted working force.

Just as there is a need for the standardization of titles for the various executives in the personnel department, so there is a need for the definition of various terms, at present loosely used in conjunction with job analysis. Job analysis will be taken to mean the process of studying all jobs. The permanent record which contains results of the job analysis will, throughout this book, be called the personnel specification. Man-job analysis, occupational specification, and job specification are other terms in current use for this same record. Finally, the term of hiring specification will be taken to indicate a condensed personnel specification for the use of the interviewer.

Personal specifications have definite value, for they record the *what* and the *how much* of every job. For management, the sequence of oeprations is indicated, permitting of better planning and allotting of work. A definite knowledge of duties, working conditions, and requirements is afforded, and needed changes often pointed out. Personnel specifications in many instances make possible functional classification of jobs. They furthermore serve as bases for wage adjustments, for specific determination of labor requirements, for improvements and other necessary adjustments. If a sudden expansion of the force is contemplated, the personnel specifications afford data upon which sources of supply can be developed.

To the personnel department specifications are almost invaluable. They supply a common ground for intelligent requisitioning, a process analogous to the requisitioning of material according to scientific specifications. The interviewer is supplied accurate information concerning the duties, hazards, disagreeable features, fatigue, requirements, etc., of each job. Selective tests in great part depend, for their standardization, upon the personnel specifications, and the same is true for ratings. In many instances, necessary training is pointed out and the content of such training clearly shown. Lines of promotion can be established, making possible a system of understudies. Misfits are often revealed, thereby enabling the personnel department to make intelligent transfers. Personnel specifications furthermore give data concerning the effect of the work upon the worker, and often point out needed reorganization of certain work. That great industrial bugbear, labor turnover, usually becomes less potent as a result of a careful job analysis.

But there are other uses of the personnel specification. Cooperation between foreman, department heads and the personnel department is promoted. Standards are set for judging the efficiency and measuring the output of workers. Information that would otherwise be lost by changing foremen is kept in permanent record form. The worker himself benefits from a careful job analysis. Before an applicant enters the concern, he understands definitely the duties and conditions under which the work is to be performed, and the possibilities of promotion can be made clear to him. The worker on the job is provided an opportunity to offer suggestions to the job analyst which otherwise would be lost. Particularly is this true if, in making the analysis, each worker is interviewed personally. Job analysis makes for contentment of the worker, for he is thereby assured that management understands just what he is doing.

From a larger social viewpoint job analysis affords data for the standardization of rates of pay in similar industries. Finally the schools are offered a more definite basis for vocational guidance and training.

There are many ways in which the results of the job analysis may be expressed. One of the earliest of these was the single descriptive paragraph in which all points were covered. This form was replaced by what might be called the sub-head paragraph method in which the personnel specification was written up under three or four main headings, such as Duties, Conditions of Work, and Man Requirements.

Another way of recording the results of the job analysis was developed during the recent war, particularly in connection with the placing of disabled soldiers. This method might be called the "code chart" method, because it shows a system of codes or symbols in chart form. The accompanying illustration (Fig. 4) shows more clearly just how this plan was used.

MAN SPECIFICATION

I	M	T	A	N	H	E	F	K	L	R	P	S	V	40
C	4/30	X	2	R	2	N	8	N	2	H	N	D	N	

Driving in
Beef Killing Department

CODE

CRI 1

1—intelligence
M—month to learn
T—training
A—arms
N—nerves
H—hands
E—ears

F—fingers
K—kidneys
L—legs
R—rupture
P—pulmonary
S—skin
V—vision

4/30—4 days
C—average
X—none
R—reliable

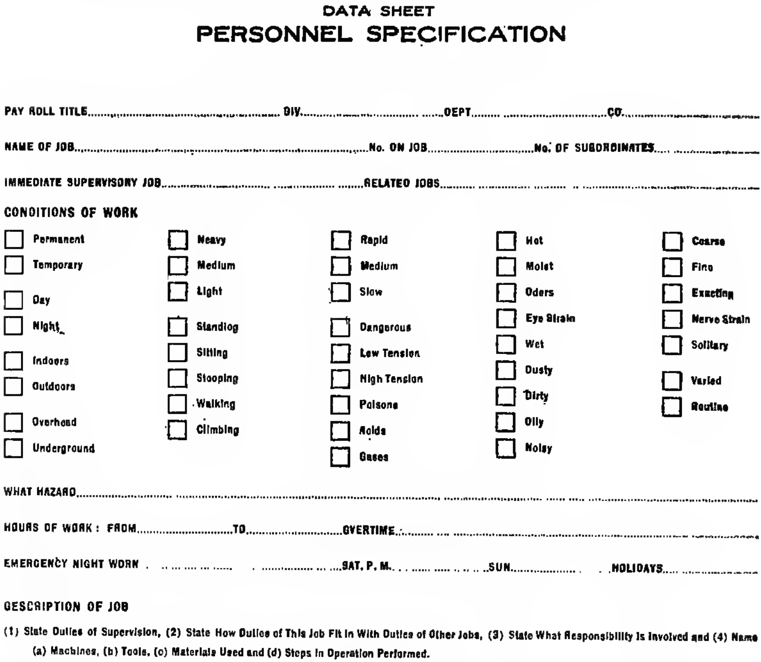
N—normal
H—hernia
D—diseased

Figure 4

Another means of setting forth the specification data is by use of the outline. Various items which apply to a particular job are listed under main headings, and subdivided much like the typical organization chart. It differs from what we have called the sub-head paragraph method in that the information is listed in words and phrases, and not in sentences.

From the use of sub-head paragraphs to a comprehensive listing of *all* possible items which might be included under each main heading is but a step. As shown in the accompanying illustration (Fig. 5) these items can readily be checked to give complete description of the job under consideration. This last method is by far the most favored form.

The items which should be included in a personnel specification often afford a perplexing problem. The following list contains points which were taken from



DATA SHEET

PERSONNEL SPECIFICATION

PAY ROLL TITLE.................... DIV.................... DEPT.................... CO....................

NAME OF JOB.................... No. ON JOB.................... No. OF SUBORDINATES....................

IMMEDIATE SUPERVISORY JOB.................... RELATED JOBS....................

CONDITIONS OF WORK

☐ Permanent
☐ Temporary

☐ Day
☐ Night

☐ Indoors
☐ Outdoors

☐ Overhead
☐ Underground

☐ Heavy
☐ Medium
☐ Light

☐ Standing
☐ Sitting
☐ Stooping
☐ Walking
☐ Climbing

☐ Rapid
☐ Medium
☐ Slow

☐ Dangerous
☐ Low Tension
☐ High Tension
☐ Poisons
☐ Acids
☐ Gases

☐ Hot
☐ Moist
☐ Odors
☐ Eye Strain
☐ Wet
☐ Dusty
☐ Dirty
☐ Oily
☐ Noisy

☐ Coarse
☐ Fine
☐ Exacting
☐ Nerve Strain
☐ Solitary

☐ Varied
☐ Routine

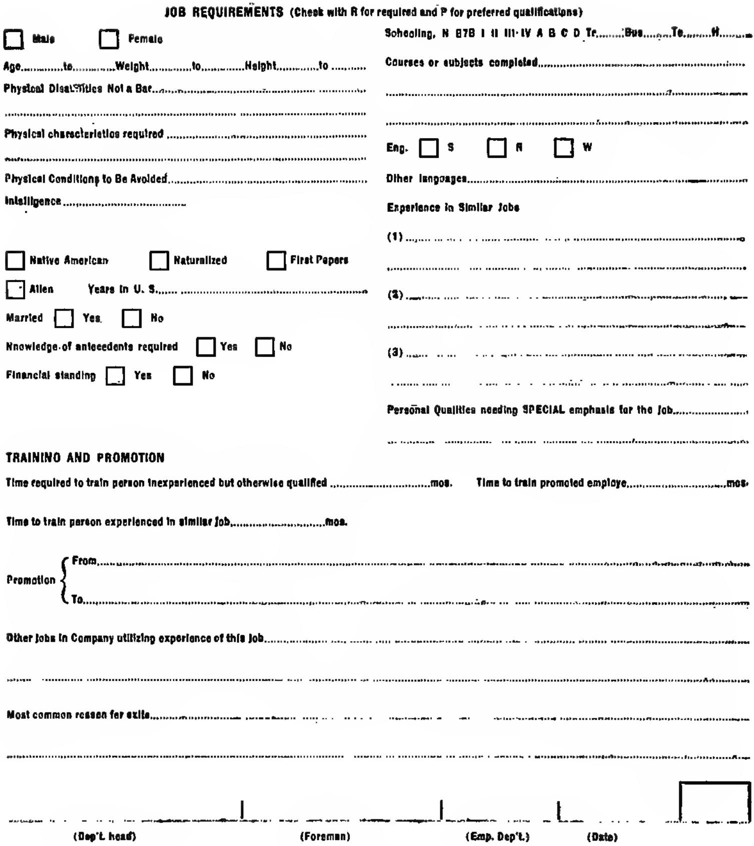
WHAT HAZARD....................

HOURS OF WORK: FROM.................... TO.................... OVERTIME....................

EMERGENCY NIGHT WORK.................... SAT. P. M.................... SUN.................... HOLIDAYS....................

DESCRIPTION OF JOB

(1) State Duties of Supervision, (2) State How Duties of This Job Fit In With Duties of Other Jobs, (3) State What Responsibility Is Involved and (4) Name (a) Machines, (b) Tools, (c) Materials Used and (d) Steps in Operation Performed.



JOB REQUIREMENTS (Check with R for required and P for preferred qualifications)

☐ Male ☐ Female

Age.......to.......Weight.......to.......Height.......to.......

Physical Disabilities Not a Bar.......

....

Physical characteristics required.......

....

Physical Conditions to Be Avoided.......

Intelligence.......

☐ Native American ☐ Naturalized ☐ First Papers

☐ Alien Years in U. S.......

Married ☐ Yes ☐ No

Knowledge of antecedents required ☐ Yes ☐ No

Financial standing ☐ Yes ☐ No

Schooling, N 678 I II III-IV A B C D Tr.......Bus.......Te.......H.......

Courses or subjects completed.......

....

....

Eng. ☐ S ☐ R ☐ W

Other languages.......

Experience in Similar Jobs

(1).......

....

(2).......

....

(3).......

....

Personal Qualities needing SPECIAL emphasis for the job.......

....

TRAINING AND PROMOTION

Time required to train person inexperienced but otherwise qualified.......mos. Time to train promoted employe.......mos.

Time to train person experienced in similar job.......mos.

Promotion { From.......

To.......

Other jobs in Company utilizing experience of this job.......

....

Most common reason for exits.......

....

(Dep't. head) (Foreman) (Emp. Dep't.) (Date)

Figure 5

a number of personnel specifications in current use. It is not believed that this list is all-inclusive, or that it will necessarily apply to all industries. It is offered as suggestive only.

ITEMS POSSIBLY INCLUDED IN A PERSONNEL SPECIFICATION

- I. General Information.
  - A. Name of job; firm; department; foreman; immediate superior; other names for job. Date.
  - B. Job symbol or code word; classification or grade.
  - C. Number on same work; number of subordinates.
- II. Description of Job Duties.
  - A. Operations—general character and complexity, logical sequence, relation to other jobs, most important duty, supervisory functions.
  - B. Equipment—description of machinery or equipment used, responsibility for care of same, tools used, issuance, care and retention of tools.
  - C. Materials—description of materials used: size, weight, etc., and frequency with which vary. Issuance and disposal of
- III Nature and Conditions of Work.
  - A. Continuity—permanent, temporary, overtime, lay-offs part-time.
  - B. Time—day or night, shifts, from when to when, meal period.
  - C. Place—outdoors, indoors, platform, overhead, underground.
  - D. Type of work—floor, bench, machine, desk.

  - E. Posture—standing, sitting, stooping, walking, climbing, lying, balancing, reaching, pulling, lifting, etc.
  - F. Operation—repetitive, automatic, varied.
  - G. Materials—heavy, medium, light.
  - H. Hazards—fire, accident, hernia, eyes, ears, lungs, heart.
  - I. Nerve strain—solitary, distracting, noisy, driving.
  - J. Eye strain—darkness, glare, intricacy.
  - K. Skill—coarse, fine, exacting.
  - L. Dexterity—slow, quick, dangerous.
  - M. Cleanliness—clean, dirty, greasy.
  - N. Atmosphere—hot, cold, wet, moist, very dry, dust, fumes, odors.
  - O. Ventilation—"stuffy", draughty.
  - P. Fellow workers—laborers, mechanics, clerical.

IV. Opportunities.
  - A. Beginning rate.
  - B. Earnings—maximum, minimum, average, schedule of increases.
  - C. Methods of payment—day, hour, week, month, piece, task and bonus, premium, profit sharing, etc. Overtime rate; Sunday and holiday rate. Paid how often?
  - D. Promotion—to what? How soon? Risk of unemployment.

V. Man Requirements for Job.
  - A. Physical—maximum and minimum limits and preferred: age, sex, color, height, weight, length of limbs, lifting strength,

gripping strength, lung capacity, sight (right and left eyes), hearing. Disabilities permissible.

B. Mental and social—intelligence rating; education: commercial, cultural, technical; special subjects necessary; extent of education; speak, read and write English; temperament: nervous, persistent, deliberate, phlegmatic, or meek, congenial, aggressive, driving. Personal characteristics: neatness, patience, carefulness, tact, etc. Interests. Social status. Bonded.

C. Experience—number of years as what; similar work. Trade ability: expert, journeyman, apprentice, inexperienced. Special training: nature, time required to learn, standard of attainment necessary.

D. Miscellaneous—tools, clothing and equipment to be supplied by worker. Married or single. Nationality preferred. Alien, citizen, first papers. Union or non-union.

VI. Remarks.

There are various sources of information for securing the data necessary to the specification. In many companies personnel specifications, in crude form, already exist. Trade schools have often made careful analysis of certain trades, and much of the data of these analyses can be carried over into industry. The Department of Labor has published some important contributions to the field; the accompanying brief specification for a

Shipping Clerk could well be adapted to the conditions in many enterprises. (Fig. 6)

SHIPPING CLERK

Description: The shipping clerk supervises the weighing, boxing, and packing of shipments, and sends a memorandum to the bill clerk or bookkeeper; also fills out bills of lading.

Qualifications: He should have had some experience in a railroad office, and should be able to route goods. He should be a good penman and be able to operate a typewriter. He should have a knowledge of geography and rail, water, and parcel-post routes.

Schooling: Common school.

Figure 6

The Personnel Division of the Army has made some noteworthy advances in specification study. The Army Trade Specifications, 565 all told, have been issued by the Government Printing Office at Washington in a book entitled, Trade Specifications and Index—United States Army. A sample Army specification accompanies. (Fig. 7)

ELECTRICIAN, SWITCHBOARD 10-sw EASOU

DUTIES

1. Erection and maintenance of all kinds of switchboads in power or lighting central or substations.

QUALIFICATIONS

2. Must be thoroughly experienced in the general assembly of all kinds of large switchboards, including construction, installation and operation, for direct or alternating, low or high tension currents, and must be a practical assembler or erector.

Must be able to work to intricate wiring drawings, and have a thorough knowledge of materials and methods of insulation, placing and supporting bus-bars, back connections and feeders, including leads to generators and motors.

Should understand the construction, operation and connecting up of circuit breakers, fuses, knife and oil switches, shunts, rheostats, terminals and instruments, also should be able to test out work.

Substitute Occupations

3. Switchboard constructor, switchboard assembler, power plant electrician.

Figure 7

Whether this book of Army specifications will be made available for general distribution or not is still a matter of question—that it would be invaluable to every employment manager is undoubted, for it lists many jobs which are identical with, or which closely parallel, those of industry.

A further contribution toward job analysis was made by the Committee on Education and Special Training through the "Instruction Manuals", covering a wide range of trades and occupations.

Still another "war source" of information on job analysis remains. This source is the "Rehabilitation Monograph Series", prepared by the Federal Board for Vocational Education, and issued through the office of the Surgeon General, Washington, These monographs, covering usually from ten to twenty pages, describe in some detail the processes, and the qualifications necessary for success, in various occupations. Scores of these have already been published—their value to the job analyst is undoubted, provided he can find the time to pick from detailed descriptions those points which are applicable to his own organization.

Qualification cards, or application blanks, of present or former employees, will often yield valuable information. The years of experience, average age, training, and nationality of workers who have left because they were discontented with their jobs often contrast strongly with similar items of present employees. In concerns where either trade or mental tests exist, the results of these tests can usually be utilized in formulating personnel specification requirements. In addition to existing specifications and qualification cards, there are three main sources for the securing of the necessary specification data. Foremen and other superiors can be relied upon for general information concerning any particular job, but not for the specific details of that job. The individual worker usually is the only one who can afford this latter. Finally, careful observation of the job or even practice in its routine by the one making the analysis is not only necessary for the successful compilation of personnel specification, but will invariably afford items which otherwise would never be secured.

In planning the job analysis, it is necessary to decide upon a method or methods of recording the data. Where adequate assistance is not provided to the person making the job analysis, the written questionnaire method is probably the best. The following section (Fig. 8) indicates a type of questionnaire which has been successfully used for office work.[1]

JOB ANALYSIS QUESTIONNAIRE

Your answer to each question may be indicated by an X placed in appropriate ().
Do you supervise any work? Yes ( ) No ( ).
Of how many people?
Do you take dictation? Yes ( ) No ( ).
What speed is necessary for the job? words per minute.
What is the average speed of dictation? words per minute.
What is the character of your dictation?

---

[1] The author is indebted to Miss H. Gerds, Fellow in Personnel Research at Carnegie Institute of Technology, for this excerpt.

Correspondence ( ) Technical ( ).
Are you ever called upon to report meetings or discussions verbatim? Yes ( ) No ( ).
If your work is largely correspondence, approximately how many letters do you turn out a day?
Do you take dictation over the telephone? Yes ( ) No ( ).
Do you handle any correspondence without dictation? Yes ( ) No ( ).
Of what kind?

Figure 8

The main drawbacks of the questionnaire method are that its scope is dependent upon the forehand knowledge of the one who devises it, that it often fails to get any personal items about a job, that it cannot sharply differentiate jobs which are somewhat similar, and that it usually neglects to provide proper means for the worker to make suggestions or to register complaints.

The personal interview will obviate the foregoing difficulties, but should be standardized. By standardization is meant, first, the decision as to just what items shall be covered, and second, the recording of these items in permanent, comparable form. The accompanying interview blank (Fig. 9) illustrates the form used for a job analysis of a plant having over 15,000 employees.

If neither of the foregoing methods is used and observation of the job is depended upon, the observer should nevertheless take systematic notes. In actual practice various combinations of the above three methods can be adapted to particular needs and will usually give better results than close adherence to any single method.

The first step in gathering the data for the job analysis is one of classification. If there is not already in existence an organization chart showing the relation of every job to every other job, the analyst should pre-

PERSONAL INTERVIEW BLANK

Name .... Job Title ....
Monthly Salary .... Department.................
Address...................... Date birth...................
Place birth .... Single........Married........
Male ...... Female ...... Test scores ....

Record of last four jobs with Progress Mfg. Co., before present job:

Job Title	Department	From when?	Salary	To when?	Salary
4					
3					
2					
1					

Record of last three jobs previous to employment with Progress Mfg. Co.:

Job Title	Firm address	From when?	Salary	To when?	Salary
3					
2					
1					

Education:	Elementary school	High school	College
	1 2 3 4 5 6 7 8	9 10 11 12	13 14 15 16

Specialization ....
Night or correspondence—Name........Length.........
Special study, or ability...................................

Outside interests, hobbies, etc.

Job Description:

Duties and responsibilities. Name machines, etc., used.

Unusual working conditions.

Job requirements:
Physical—
Mental—
Experience—

Type of work employee prefers, or is working for—

Remarks:

	Rating				
	Excellent	Good	Average	Poor	Deficient
Quality-work.					
Attitude......					
Exec. ability.					
Physique.....					
Total....					

Date .... Interviewed by ....

Figure 9

pare one. Occupations must at first be listed and classified under the present terminology. Standard titles and symbols should then be assigned for similar jobs as far as known. This completes the first broad step in gathering the data for the job analysis.

The points to be covered in the job analysis must next be decided. These points usually fall under some such headings as the following:

1. General information.
2. Description of job duties.
3. Nature and condition of work.
4. Opportunity.
5. Man requirements.

In gathering the actual data about each individual job, it is better to begin with the best known department. When those data which can be obtained from the worker himself have been secured, either by questionnaire, interview or observation, other sources of information must be developed. The hazards and health requirements of any particular job can usually be secured from superiors, physician, nurse, or safety man. Similarly the mental and experimental qualifications can be secured from the employment director, interviewer and educational director. Wherever possible, man requirements should be stated in quantitative terms.

Having secured the desired information, a comparison of results necessarily follows. Many similar jobs will be found masquerading under different names. These should be grouped under definite comprehensive titles. Often minor subdivisions of jobs similar in nature will permit of quite comprehensive classification. Thus, the following grouping contains similar jobs that previously had gone under three different titles:

Head Lineman
Lineman 1st Class

Lineman 2nd Class
Lineman 3rd Class
Lineman's Helper

When each job has been tentatively written up in the light of all available information it should be reviewed and revised by the various original sources: worker, superior, physician, etc. On the basis of these revisions the final specification can be made.

In the compilation of personnel specifications into permanent form there are five critera which should be carefully observed. It is self-evident that the specification for each job should be comprehensive,—should include all necessary items. Second, the specification should be as brief as possible—brevity can be said to be the soul of a specification as well as of wit. Again, the specification should be differential. In other words, each specification should contain points which make it distinct from any other specification. Another criterion in the final formulation of personnel specifications is that they shall be couched in standardized terms, i.e. that the same activity shall always be called by the same name. Finally, the personnel specification should be specific. Generalizations, such as "does general clerical work" mean little or nothing to an interviewer.

In formulating that section of the specification which is included under the general heading of definition of duties the following rules should prove of assistance.

RULES IN FORMULATING DEFINITIONS OF DUTIES

1. Do not capitalize titles, or unit designations. (Not "Ledger Clerk," but "ledger clerk"; not "Power Department," but "power department").

2. The entire definition should be stated in a single paragraph, consisting of one or more sentences.

3. Use the singular number, regardless of the number of men contemplated to work on a job. (Not "Ledger clerks make out", but "Ledger clerk makes out").

4. Use an active verb in describing duties. (Not "Ledger is made out by", etc. but "Ledger clerk makes out", etc.)

5. Omit subject of sentence when same is identical with the title of job being described. (Thus, in describing ledger clerk, not "Ledger clerk makes out", but simply, "Makes out", etc.)

6. Omit all articles unnecessary to sense.

7. Omit all qualifying adjectives or phrases unless they are important to the sense as limiting duties. (Not "A *good* ledger clerk keeps more than", etc., but simply, "Keeps more than", etc.)

8. If qualifying phrase or adjective makes meaning more clear, although unrelated in part, retain it. (Thus, "Keeps all *miscellaneous* accounts", clarifies the duties by the adjective.)

9. Do not use technical terms without explanation.

10. Arrange contents of description logically.

11. Where duties vary, place emphasis on proper phase.

12. State duties *as duties* and not as qualifications. (Not "Should be able to direct", but simply, "Directs", etc.)

13. State nothing but duties in this section of specifications.

14. State what the duty is, not how it is done.

15. Do not describe routine duties in detail.

16. Avoid generalities. (Not "Attends to office work", but "Files correspondence, checks bills", etc.)

17. The reading of duties alone should, without reference to other data, make apparent what job is meant.

Following the compilation and revision of the personnel specification there should result various readjustments. In many instances duties should be redistributed, and lines of transfer and promotion established. These changes will usually necessitate a revision of the organization chart. When the final personnel specification presents a clear picture of each job, all jobs should then be grouped according to their value to the company. Such grouping supplies the necessary basis for wage adjustments.

Many companies have compiled their specifications into a booklet, which also contains information and instructions for the interviewer. This booklet should be distributed to foremen and department heads for their general guidance in interpreting company policies and to aid them in intelligent requisitioning.

If personnel specifications are considered too detailed for use by the interviewer, they can be condensed into hiring specifications. In actual practice it is found difficult to induce interviewers to use any kind of specification at all. It should be noted that, although the personnel specification constitutes a permanent record in the accepted sense of the term, it must be periodically checked and revised if it is to be of greatest use.

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CHAPTER III

STUDY OF THE COMMUNITY

As contrasted with that phase of the personnel audit which deals with conditions inside the plant, the study of the community is concerned with those factors outside the plant which have direct or indirect bearing upon the working force.

Undoubtedly there is great need for mutual understanding and respect between what we call Capital and Labor. The counterpart of the arrogance of wealth is found in the intolerance and ignorance of the hidebound unionist. Both must be changed. No longer must the human refuse of Juggernaut machinery be cast upon the mercies of society. The economic limit to the division of labor must be established before men are made into automatons,—or anarchists. Workers must be educated for ever higher work, must be made to understand that their interests are essentially those of management, of capital, of society as a whole. If the employer wishes to understand thoroughly any group of employees he must know where and how that group lives outside working hours.

The object of the community study is to substitute *facts* for beliefs. Since practically every concern secures its supply of workers from the immediate vicinity, it is desirable to obtain all possible information concerning the nature of all workers in the community. On a basis of this information, an intelligent development of labor supply is made possible, although it is of course not necessarily guaranteed by it.

Facts about the living conditions are highly valuable.

Workers cannot work at top speed efficiency if their home lives are unhygienic or deficient in satisfaction of instinctive yearnings. This connotes a study of community facilities having to do not only with health, but also with education, recreation, etc. Furthermore, a study of the cost of living of the community is essential for proper wage adjustment. The value of the dollar is purely relative—$6.00 in Detroit may not be the equivalent of $5.00 in some other city. On the basis of *facts* the employer can better determine personnel policies.

The director of the community study should possess many virtues. One previously skilled in social work will usually have a good background of experience in uncovering sources of information. In attacking the problem the usual scientific procedure should be followed. Such procedure involves six steps: statement of the purpose; securing of the facts; arrangement of the data; interpretation of relations; outlining a plan of action: and, finally, a checking up of the effectiveness of the plan of action.

As a by-product of the community study splendid material for company advertising and for educational work among the employees is often brought to light.

Preliminary to the actual gathering of community data, it is necessary to decide upon the items which are to be included in the scope of the investigation. The following will be here considered:

1. Reputation of the company.
2. Supply of workers.
3. Nationalities predominant.
4. Schools and colleges.
5. Current wage rates.
6. Housing and living conditions.
7. Hygienic conditions.

8. Transportation.
9. Business facilities.
10. Recreation and social activities.
11. Cost of living

The reputation of the company as an employer can be secured from former employes who have left the company for various reasons, and from tactful inquiries from present employees during the job analysis. Members of business and trade organizations in the community will often supply illuminating comments upon the question of company reputation. Employment agencies usually receive candid criticisms of various companies and afford, therefore, a valuable source of information. Finally, the attitude of the public as a whole can often be gauged from newspaper articles, or from comments which salesmen receive.

Consideration of the supply of workers is related to practically all of the headings given above. It is usually desirable to discover the density of the population of the community. One way to roughly calculate this is to multiply the number of votes cast in the district by five. Fifty per cent of this number will be males. but only thirty per cent will be adult males. This last number should correspond roughly to the number of children and youth in school from the particular district.

Comparison of the ratios of various nationalities within the company with similar ratios in the community will often suggest the nationality of the worker who seems best fitted for the work of the particular concern. It is usually quite difficult to arrive at fairly accurate figures concerning the nationalities of the community. Commercial credit houses, social service exchanges, school and civic surveys often list such information in one form or another. It is interesting to compare graphically the result so found with the entire city, with the communities which surround rival concerns, or with that of branch plants. On the basis of the findings in connection with the nationalities in the community, a study of social habits can be made. Thus, one company discovered that Spaniards were prone to quit as a body if any one of the group either left or was discharged.

Schools and colleges afford a valuable source of labor supply. The total yearly graduations, and the nature of the training, indicate the value of graduates. As a further index the success of former graduates should be noted. This study should include the accessibility of libraries as well as of schools, and also the influence of newspapers and propaganda. The adequacy of the school work in the community can often be judged to some extent by records of attendance and delinquency. Finally, careful methods of selecting graduates should be worked out.

Probably one of the most important phases of the community study is the uncovering of current wage rates and of hours of labor. In this connection it is necessary to study the union scales. A comparison of company rates with those paid by other concerns in the community, in the city as a whole, or by rival concerns, will often reveal glaring discrepancies and point out necessary readjustments.

A study of the sources of labor supply would not be complete if the investigator failed to suggest possible extensions. Men who have been disabled often become the most faithful employees, although the compensation risk is usually greater. The Miller Lock Company of Philadelphia made a successful experiment in the employment of the blind. Women fit into many jobs better than men and are usually more conscientious; the same is often true of older men. In developing schools as sources of supply, part time work may be encouraged, the plant paper sent to the school library, students conducted on tours through the concern, exceptional students interviewed personally and alumni employees utilized to encourage the students to enter the employ of the company.

The analysis of housing and living conditions is an exceedingly complex problem. It is not sufficient to study the homes of the workers in the organization, although these might and should be studied in detail. Congested lodging houses, dens of vice, red light districts and the like must all be noted in an adequate consideration of the housing problem. Undoubtedly a house to house canvass will supply the most accurate information, and often succeeds in stirring up interest among former employees. It is not absolutely necessary to consider *every* home in the community. If every second, or fifth, or tenth, house is considered, the results will be fairly representative of the group as a whole. The thoroughness of the investigation will depend upon the scope, budget and time limit of the investigation and upon the features which are to be utilized in future personnel work.

In making a detailed survey of the homes of workers, the investigator has two courses of action open to him. He may either attempt to sell his plan to the employees, or he may carry on the work without undue publicity. In the former instance, his chances of success will depend upon the previous relations existing between employer, and employee, and in great part upon his own selling abilities. The housing investigation has, in many concerns, aroused great antagonism and has probably worked more harm than good. Visitors to homes must be exceedingly tactful, and cannot, as one visitor on this work did, turn back a counterpane on the bed, comment aloud "bed disorderly", record the valuable discovery, and then marvel at the forthcoming vituperation. However, all data should be recorded in some form or other. The accompanying scale for Grading Homes of Workers is offered as suggestive of the type of thing that might well be attempted without arousing animosity. The standards given in this scale *must* be readjusted to meet particular needs, and cannot be adopted bodily. It may be necessary to make a brief preliminary survey of homes in order to assign points properly. The scale should be printed on a standard size card, so that it may become a permanent record. If it is believed necessary to make the study of home conditions without first selling the idea to workers, this scale should prove of assistance in formulating items to be covered. Many employers take a decided stand against any "prying" into the home lives of their workers; other employers carry out such work with wholehearted convictions as to its justification. These two groups are to be respected for their beliefs, but the employer who investigates the homes of his workers from a viewpoint other than the social is to be strongly condemned.

Scale for Grading Homes of Workers

Dweller—John Foggia
Nationality—Italian
Street—Rush St.
Number—12
Ward—Tenth

Scoring
5 points—excellent
4 " —good
3 " —average
2 " —poor
1 " —deficient
0 " —totally deficient

I. **Necessities**—20 points		
Food and clothing	1 to 5 points	2
Shelter, heating, lighting	1 to 5 "	3
Furnishings	1 to 5 "	1
Comforts	1 to 5 "	0
	Total	6

II. **Neatness**—20 points

Exterior arrangement	1 to 5 points	3	
Interior neatness	1 to 5 "	1	
Sanitation facilities	1 to 5 "	2	
Repair and upkeep	1 to 5 "	2	
	Total		8

III. **Size**—15 points

Number of rooms (including bathroom and cellar)			
11 and above	5 points		
8 to 10	4 "		
7	3 "		
5 to 6	2 "		
4 and below	1 "	2	
Average size of rooms			
Over 180 square feet	5 points		
140 to 179 " "	4 "		
120 to 139 " "	3 "		
100 to 119 " "	2 "		
Less than 100 square feet	1 "	3	
Number of inmates per room			
.3 and less	5 points		
.4 to .5	4 "		
.4 to .8	3 "		
.9 to 1.0	2 "		
More than 1.0	1 "	4	
	Total		9

IV. **Dwellers**—15 points

Helpfulness of wife	1 to 5 points	4	
Number of children			
1 to 3	5 points		
4 or none	4 "		
5	3 "		
6	2 "		
7 and over	1 "	5	
Dependents other than wife and children			
None	5 points		
1 partial	4 "		
2 or more partial	3 "		
1 total	2 "		
2 or more total	1 "	4	
	Total		13

V. **Home Income**—30 points

Sources		
Worker alone	5 points	
Plus family member over 21 years	4 “	
Plus family member 16 to 20 years	3 “	
Plus lodgers	2 “	
Plus children under 16	1 “	3
Regularity		
Unvarying (as in salary)	5 points	
Varying (as in commission)	4 “	
Piece work basis	3 “	
Seasonal employment	2 “	
Layoff, average 2 days per week	1 “	2
Income—average yearly income per inmate housed and fed		
Over $1,000	20 points	
$700 to $999	16 “	
$400 to $699	12 “	
$200 to $399	8 “	
Less than $200	4 “	8
	Total	13
TOTAL HOME INDEX		49
GROUP AVERAGE HOME INDEX		56

Remarks:

Photograph of Home

Date.......................   Visitor.......................

Growing out of the analysis of home conditions, there should result definite recommendations as to improvements and as to the part which the employer should play in carrying out the improvements, such as fostering of clubs, home gardens, educational work and similar activities.

Hygienic conditions are not always under the control of the home, but they do have decided effects upon it. A proper water supply, adequate illumination, and disposal of sewage and rubbish are essential to health and efficiency. Keeping of animals is a practice to be discountenanced, particularly under congested home conditions. Damp cellars, various kinds of house vermin, and lack of fresh air and sunshine, are factors which too seldom are considered in studying the health of workers, for their harmful effects are usually quite insidious.

Of minor importance, perhaps, but worthy of consideration nevertheless, is the problem of transportation. The suggestion in the report to the X Company, previously cited, concerning the use of a large map and pins to show nearness and density of workers, might well be carried out in every concern. The main points to be noted are the distances from the plant, the number of lines, adequacy of service, cost, congestion, time spent on the cars, and the relation of transportation facilities to the lateness problem. Suggested improvements should, of course, follow the study.

The business interests of the community constitute a personnel liability or asset. The retail stores have great influence upon the housewife, and therefore, indirectly upon the worker. When retail stores are being reviewed many phases of the cost of living study can be carried on simultaneously, particularly those phases which relate to the costs of various commodities. Banking facilities and loan sharks are positive and negative aspects of one problem of vital importance to the worker. Savings' accounts constitute a vital index. The diversity of manufacturing interests in the community often has great bearing upon the wages which must be paid in order successfully to compete for help.

Every human being craves recreation and social activity in one form or another. Many workers exist through eight or ten hours of labor simply that they may secure outside pleasures. It is essential, then, that the employer understand what kind of recreation his workers demand, particularly if he is planning to include forms of recreation in the personnel activities. Dancing as such may be a harmless recreation, but the dance hall of the community may be a source of vice. The nearby "movies," or the cheap vaudeville house, as well as the dance hall, should be subjected to careful inquiry. The good effects of churches, athletic associations, playgrounds, Y.M.C.A.'s and the like should be noted. On these bases the investigator should be able to state the desires of the persons involved, the results of satisfying those desires according to existing means, and should suggest how those desires could be utilized to the advantage of the employer and to the betterment of the employees.

The tendencies of growth of the section under consideration should be carefully noted. A rapidly shifting population might, within two years time, invalidate the findings of the investigator. A community which is degenerating forces the employer either to develop new sources of supply or to attempt to counteract the degenerating influences. In concluding the study of the community facilities the investigator should in all possible aspects compare the community with the rest of the city or with another well known community.

Of fully equal importance to the analysis of living conditions is one of the cost of living. There are two methods of attacking this problem: the absolute and the relative. The investigator may either arrive at his conclusions by summing up the cost of all items in the average family budget (absolute method), or he may compare the cost of various articles in the community with the cost elsewhere (relative method). The latter is far easier, and furthermore provides a means of comparing the purchasing power of a dollar in the community with its purchasing power in other localities. Such comparison in turn facilitates a more intelligent contrast of wage rates. The relative method only of arriving at an index of the cost of living will be here considered.

The Department of Labor and the National Industrial Conference Board afford the two main sources of information. Although the findings of the two do not differ materially it is probably safer to depend upon the data of the former, because of the greater accessibility of its findings and of the greater probability of permanency.

The Department of Labor has studied the cost of living under various headings—food, clothing, shelter, heat and light, etc. Under each heading nuemrous representative items have been considered, and the costs combined to arrive at the relative cost increases of the main headings. A further study was made to discover what portions of the family budget each main heading occupied. Then the various costs were weighted in accordance with their relative importance in the budget to yield the final index. The accompanying chart (Fig. 10) shows the increases in the total cost of living from 1914 to 1919 inclusive.

The following excerpts, taken from the Monthly Labor Review for October, 1919, are of interest here.

> "The determination of changes in the cost of living, to be at all accurate, must be based upon the retail costs of the various items entering into the ordinary family budget, weighted according to the importance of such items in the budget. Prices of commodities, as the term is usually used, do not constitute a complete index of the cost of living. Thus prices of food, fuel and clothing may go up 100 per cent., but if rent and sundries (which take about one-third of the

average family's income) advance say, only 10 per cent., the real increase in cost of living will be less than 70 per cent.

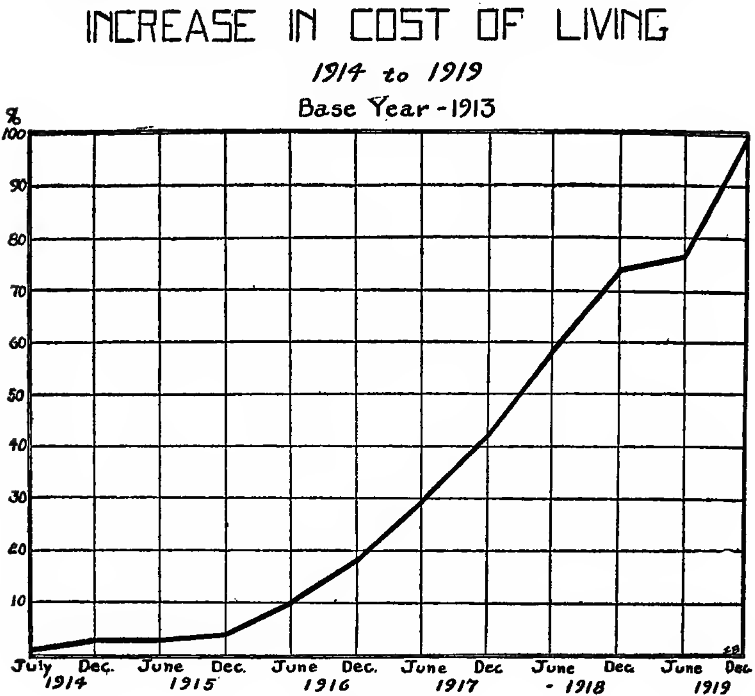

Figure 10

"Retail prices of food offer a good guide to changing living costs, but cannot be taken as conclusive, as food is only one item, although an important one in the family budget.

"The making of cost-of-living surveys is very laborious. It means collecting prices of food, clothing, house furnishings, rents, etc., from a large number of dealers. The paramount difficulty is that, during the past few years, there has been considerable lack of uniformity in the increasing cost of living in different cities and different sections. Because of these wide variations between communities, each community must be dealt with separately and, for certain purposes such as local wage adjustments, cost-of-living data may be completely satisfactory only when they are based on investigations in the particular locality."

In attempting to compare the cost of living of any particular community with that of any other community it is obvious that the same items must enter in and the same weightings be used. In the Monthly Labor Review and in other publications of the Department of Labor, the items used are listed in detail, so that the task for the inexperienced investigator is not so hopeless as it first seems.

Since the proportion of expenditure which rent, for instance, occupies in a yearly income of $1000. differs materially from that in a yearly income of $5,000 the investigator is often perplexed to decide upon the relative weightings when he attempts to group the employees according to yearly income. The following table (Fig. 11) should prove of assistance.

PER CENT OF EXPENDITURE PER ANNUM FOR THE PRINCIPAL ITEMS OF COST OF LIVING, BY INCOME GROUPS

Income Group	Percent of Families	Food	Clothing	Rent	Fuel & Light	Sundries	Total
Under $900	2.7	44.1	13.2	14.5	6.8	21.4	100.0
$900 & under $1,200	20.0	42.4	14.5	13.9	6.0	23.1	100.0
$1,200 & under $1,500	32.7	39.6	15.9	13.8	5.6	25.0	100.0
$1,500 & under $1,800	22.6	37.2	16.7	13.5	5.2	27.3	100.0
$1,800 & under $2,100	13.2	35.7	17.5	13.2	5.0	28.5	100.0
$2,100 & under $2,500	5.8	34.6	18.7	12.1	4.5	30.0	100.0
$2,500 & over	2.9	34.9	20.4	10.6	4.1	30.1	100.0
Total	100.0	38.2	16.6	13.4	5.3	26.5	100.0

Figure 11

The method used by the Holt Manufacturing Company, of Peoria, Illinois for studying the increased cost of living in its community, and for making a wage adjustment, is of interest here. The following outline includes the principal steps:[1]

---

[1] Bulletin of the Taylor Society, October, 1919.

1. Reference reading on the subject.
2. Determination of base year—1913 taken.
3. Determination of items entering into basic cost of living.
4. Preparation and submission of questionnaires to workmen.
5. Determination of size of average family—3.6 adult males used.
6. Determination of kind of articles, and amounts, entering into each item of basic cost of living for average family:
   a. Food
   b. Clothing
   c. Fuel
   d. Shelter
7. Computation of cost of living from above.
8. Tabulation of results of No. 7.
9. Computation of average wage rate, for years considered, from company payrolls.
10. Tabulation of results of No. 9 according to average rate of wages, and years.
11. Computation and charting of results of Nos. 9 and 10 on percentage basis, using base year as zero point.

It is impossible to give a standardized method of compiling the various data of the entire community study. Findings should, wherever possible, be related to conditions inside the plant which have been uncovered by other phases of the personnel audit. The final form should embody striking charts and graphs, summary tables, detailed presentation of studies and, standing out boldly, recommended improvements or modes of action. The graphic form of presentation cannot be too strongly emphasized.

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Chapter IV

LABOR TURNOVER AND LABOR LOSS

Labor turnover may roughly be considered as the number of employees who terminate employment during any given period. The unit under consideration is, of course, the employee. The turnover cycle begins when the applicant is hired, and ends when he leaves. That is, the duration of the cycle includes the entire work-life of the employee. The index of labor turnover, then, is the percentage ratio of the workers who leave a company during any given period to the average number of workers on the payroll during that period. If the average number on the payroll is one thousand, and one hundred leave, then the turnover index is ten per cent.

We have mentioned the turnover *index*. An an index it must point to some condition of the business, and must have definite significance when it becomes larger or smaller. The temptation is to draw hasty conclusions on the basis of a varying turnover. An increased index does not necessarily mean decreased efficiency of the working force nor of the personnel department. Nor are the opposite conclusions from a decreased index necessarily true. There are many other factors, such as time of the year, scarcity or surplus of labor, constancy of new orders, etc., which may enter in.

Graphic presentation of turnover conditions are often quite startling. The accompanying chart (Fig. 12) based on some twelve hundred cases shows the rapidity with which men left one plant. The fact that at the end of twelve months only seven per cent of those em-

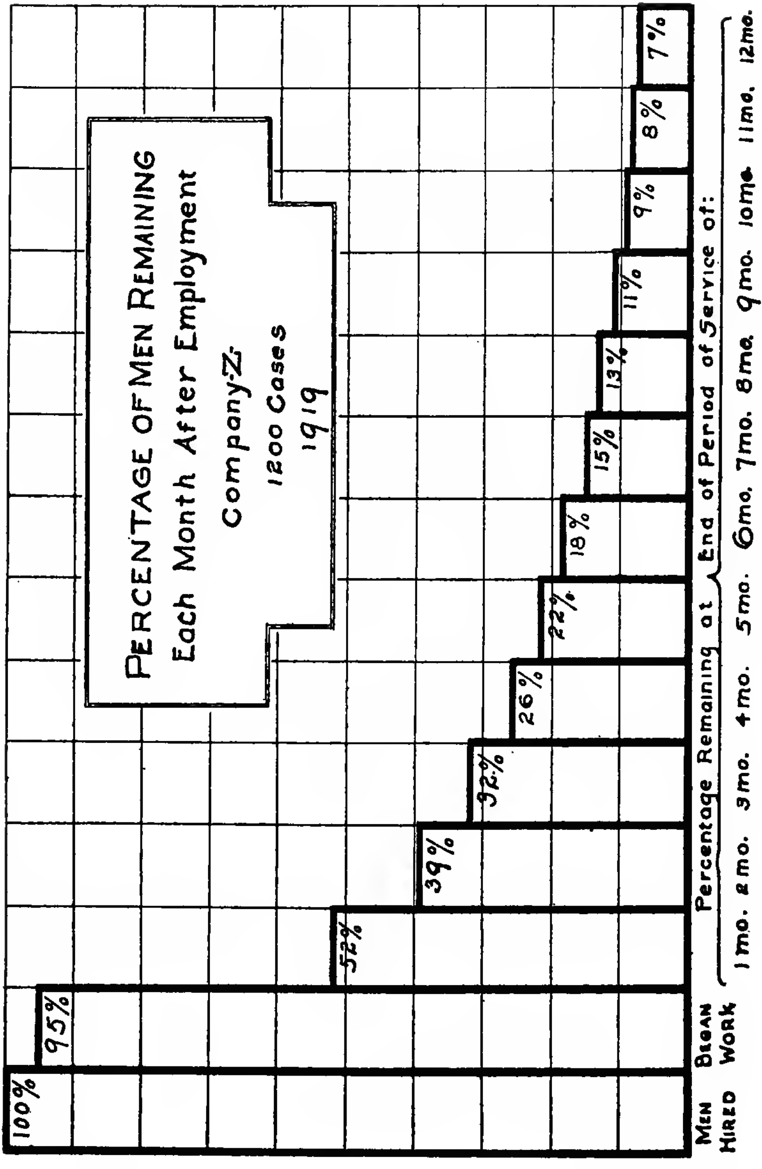
PERCENTAGE OF MEN REMAINING
Each Month After Employment
Company Z
1200 Cases
1919
100%
95%
52%
39%
32%
26%
22%
18%
15%
13%
11%
9%
8%
7%
MEN HIRED
BEGAN WORK
Percentage Remaining at End of Period of Service of:
1 mo.
2 mo.
3 mo.
4 mo.
5 mo.
6 mo.
7 mo.
8 mo.
9 mo.
10 mo.
11 mo.
12 mo.

Figure 12

ployed were still with the company supplied considerable food for reflection. The general shape of this curve is representative, although the final per cent will vary with different grades of work. In this particular instance a great majority were unskilled laborers, which accounts in part for the very small number remaining after twelve months. Other investigators have confirmed this last statement: there is a high correlation between illiteracy and turnover. The obvious deduction to be drawn is that if the illiteracy is decreased the turnover will also be decreased.

The cost of labor turnover is far greater than one would at first imagine. Magnus Alexander of the General Electric Company made the first comprehensive study of the cost of turnover. Mr. Alexander divided workers into five main groups, and calculated the cost of each group separately. The division was as follows:[1]

Group A—Highly skilled mechanics who must have practiced their trade for a number of years in order to attain the required degree of all-round experience and proficiency.

Group B—Mechanics of lesser skill and experience who could have acquired an average degree of proficiency within a year or two.

Group C—The large number of operatives usually known as pieceworkers who, without any previous skill or experience in the particular work, can attain fair efficiency within a few months, somewhat depending on the character of the work.

Group D—Unskilled productive and expense laborers who can readily be replaced in the course of a few days.

Group E—The clerical force in the shops and offices.

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[1] **U. S. Bureau of Labor Statistics. Bulletin 227. October, 1917.**

For these groups, Mr. Alexander calculated the costs as shown in the following table:

ITEMS OF COST FOR NEW EMPLOYEES

Group	Hiring	Instruction	Wear and tear	Reduced production	Spoiled work	Accidents	Total
A.......	$0.50	$ 7.50	$20.00	$21.50	$10.00	$3.00	$62.50
B.......	0.50	15.00	20.00	23.30	15.00	3.00	76.80
C.......	0.50	20.00	20.00	31.80	10.00	3.00	85.30
D.......	0.50	2.00	1.00	5.00	....	3.00	11.50
E.......	0.50	7.00	1.00	21.50	....	3.00	33.50

In 1913 the average turnover in fifty-seven Detroit factories was 252 per cent. From October 1912 to October 1913, the Ford Motor Company had a turnover of 400 per cent. In 1914, this had been reduced to twenty-three per cent, and still later to two and one-quarter per cent. The Dennison Manufacturing Company lowered its turnover index from sixty-eight per cent in 1911 to thirty-three per cent in 1915. Similarly, the Joseph & Feiss Company decreased the figure of 150 per cent in 1910 to thirty-three per cent in 1914. These results show what can be done when the condition is realized and the problem attacked with vigor.

Aside from the issue of the costs involved, the purpose of studying turnover is to determine one aspect of the efficiency of the working force. The results obtained from such a study are usually quite interesting. For instance, the belief that there is less mobility among women workers, older men, and married men, has been definitely proven. Again, the turnover has been found to be less in commercial than in industrial and transportation organizations; in industries requiring light labor than in those involving heavy work; in skilled occupations than in unskilled. In practically every instance decreased turnover has been followed by increased production and lessened cost. One concern reduced its turnover from 150 per cent to 33.5 per cent, and its manufacturing cost was lowered by 10 per cent and its production increased by 42 per cent. However, the turnover should never be reduced to such an extent that stagnation will result. Most employment directors are quite willing to run this risk.

Recently the Department of Labor made a study of turnover in various sections of the country, covering the years 1916, 1917 and 1918. Following are the results from four mid-western cities:

Turnover Analysis In Four Cities

City	Number of Separations	Discharged Per Cent.	Paid Off Per Cent.	Mil. Service Per Cent.	Quit Per Cent.
Cleveland...	44,594	9	5	5	81
Detroit.....	123,437	11	7	8	73
Cincinnati..	15,582	12	1	6	81
Milwaukee..	37,016	8	2	6	83
Total....	220,629	(10.5	5.5	7.0	77.0)
		(.....Weighted		Averages.....)	

The striking fact about the foregoing figures is that over three quarters of the turnover was due to *voluntary* separations.

The reasons men give on leaving employment are many and varied, indeed. To merely tabulate these without further analysis is but to tabulate blanket statements which are quite often not entirely accurate. Admittedly, such tabulation may be the first step. But each statement should be broken up into its component parts, so that the *unit causes* may be discovered. Such causes, once found, may then be attacked without fear that the results will be obscured by other unknown factors. Following is a list of reasons for labor turnover and suggestive remedies. It is not believed that the reasons here listed are "unit causes", nor that the remedies suggested will act with the certainty of chemical reagents, but they should assist the research director who is attempting to analyze the turnover.

REASONS FOR LABOR TURNOVER AND SUGGESTED REMEDIES

Voluntary

	Reason		*Remedy*
1.	Low wages.	1.	Train for better work; relate wage to output.
2.	Long hours.	2.	Shorter hours with pay based on output.
3.	Inequalities of pay.	3.	Wage adjustment; known schedules of pay.
4.	Fancied wrongs.	4.	Closer supervision; grievance outlet.
5.	Unsafe or unsanitary conditions.	5.	Health, safety, betterment work, etc.
6.	A dislike for kind of work.	6.	Better selection and training; transfer.
7.	Wanderlust.	7.	Pensions, savings, and home owning plans; profit sharing; stock selling.
8.	Inability to get along with fellow workers or foreman.	8.	Transfer, grievance hearing; grouping of nationalities.
9.	Better position.	9.	Pay current wages or better; lines of promotion known; advertise advantages of work.
10.	The plant is hard to get to (a) Takes long time. (b) Additional carfare.	10.	Original location carefully selected; supply transportation methods; build houses.
11.	Unsatisfactory living conditions in plant, neighborhood or town.	11.	Home owning plans; cooperative buying; betterment facilities; aid in civic movements.
12.	Inability to see anything ahead; no promotion.	12.	Lines of promotion known; training opportunities.
13.	Leaving city.	13.	General improvement of opportunities; aid in civic movements.
14.	To marry.	14.	Encourage workers to remain after marriage.
15.	Failure of health; work too hard.	15.	Proper working conditions; health propaganda.
16.	Resents supervision or criticism.	16.	Train more tactful superiors.
17.	Refusal to be transferred.	17.	Create desire for transfer before the act, by showing advantages.
18.	To school.	18.	Educational opportunities in company; part time classes.
19.	To stay at home.	19.	Contrast work at home with profitable work in industry.
20.	Domestic conditions.	20.	Domestic aid and counsel.
21.	Dislikes superior.	21.	Transfer; more careful placement.
22.	Unsuited for work at which placed.	22.	Better selection; training; transfer.

23.	No reason given.	23.	Tactful interview at termination of employment.
Laid Off			
1.	Dull season.	1.	Develop a fill-in product.
2.	Bad weather.	2.	Provide special indoor work.
3.	Faulty scheduling of work.	3.	Better planning and checking up.
4.	Health.	4.	Proper working conditions; health propaganda.
5.	Disciplinary measure.	5.	Substitute man to man talk.
Involuntary			
1.	Incompetency; slowness; illiteracy.	1.	Training; Americanization; better selection.
2.	Carelessness and indifference.	2.	Supervision and inspection; payment by product rather than by time.
3.	Personal dislike of foreman.	3.	Deprive foreman of power to discharge. Train foremen.
4.	Disagreements with fellow workers.	4.	Transfer; grievance hearings; grouping of nationalities.
5.	Agitator.	5.	Proper working conditions; plant paper; direct energies of agitator into constructive channel.
6.	Insubordination.	6.	More tactful executives; transfer.
7.	Drinking.	7.	Hot lunches; tobacco and candy available for purchase.
8.	Irregular attendance.	8.	Home visitors; attack on causes; bonus for regular attendance.
9.	Outside difficulties; vice.	9.	Legal and domestic aid; recreational facilities.
10.	Suspected dishonesty to company.	10.	Remove temptations.
11.	References.	11.	Investigate thoroughly; or disregard and give man another chance.
12.	Reduction of force.	12.	Help place with other companies.
13.	Health.	13.	Proper working conditions; health propaganda.
14.	Death.	14.	Proper working conditions, health propaganda.
15.	Union member.	15.	Change policy of discrimination against union members.
16.	Refusal to join union.	16.	Insist on open shop.
17.	Abuse of authority.	17.	Training in tact; written definitions of authority.

It is very seldom indeed that a man leaves for *one* cause only. He himself may not be able to analyze his reasons. The final interviewer must judge from the general attitude of the departing worker as well as from what he says. Some firms have already recognized this fact, and are listing primary and secondary causes. This method merely goes one step farther, and assumes that there are two causes. As a matter of fact the real cause may be a complex, consisting of any number of elements, no one of which would be strong enough to induce the worker to quit, but the combination of which brings this about. Still another step in advance of the listing of primary and secondary causes is for the final interviewer to weight the various items which he believes have caused the worker to leave. This weighting can be done most readily on a percentage basis. Thus, Michael Brogan may have left because he had a better position (75%), tactless foreman (15%) and working conditions (10%). When tabulations such as these have been made for some time, the research division should undertake the task of discovering the most offending causes, and of eliminating them. The above method of assigning percentages to various unit causes is not scientific, perhaps, but it is certainly better than the acceptance of blanket statements from men who are only anxious to secure the payoff slip.

Workers in the field of industrial relations are feeling the need of standardization of terminology. The following code for the recording of facts about labor turnover is offered. It is simple to comprehend and remember, yet affords at a glance the nature, responsibility and specific cause for each separation.

Facts are recorded in a code consisting of at least three parts. The first part shows the nature of the separation, and is indicated by capital letters according to the following code:

Nature of Separation	Code Letter
Involuntary separation	I
Voluntary separation	V
Temporary separation	T
Transfer	TR
Absence	A
Lateness	L

The second part deals with the responsibility for the separation, as indicated below:

Responsibility for Separation	Code Letter
The employee responsible, in great part, for condition revealed by the first letter	E
The company responsible	C
Other conditions which neither employee or company could control, responsible	O

The third part of the code shows the specific cause as listed in the following code:

Specific Cause of Separation	Code Letter
Absent with permission	ab
Absent without permission	abno
Agitator	ag
Attendance	at
Authority, abuse of	au
Carelessness	ca
Character	ch
Court duties	co
Crime	cr
Death	d
Discipline	disc
Dissatisfied	dis
Distance from plant	dist
Domestic affairs	do
Drinking	dr
Fellowworkers	fel
Fighting	fi
Gambling	ga
Grievances	gr
Health	he
Holiday	hol
Home affairs	ho
Hours	hrs
Illiteracy	ilt
Incompetency	inc
Indifference	ind
Insubordination	ins
Injury—in employ	in

Injury—not in employ	inno
Knowledge lacking	kn
Living conditions	liv
Loafing	lof
Lockout	lok
Lying	ly
Marrying	mar
Moving	mo
Non-union member	non
No reason	no
Opportunities lacking	opp
Other position	oth
Personal business	pe
Physically unfit	ph
Reduction of force	red
References	ref
Reinstated	ren
Rules, infraction of	ru
Scheduling of work faulty	sch
Season	se
Sick	si
Sleeping on job	sl
Slowness	slo
Strike	st
Union member	u
Vacation	va
Vice	vi
Wages	w
Wanderlust	wan
Weather inclement	we
Working conditions	wo
Work lacking	wono

A few examples will show how the three codes should be used. If Tom Smith has been discharged because of an infraction of rules, the code "I-E-ru" is entered on his card. If he had been transferred because work in his department was slack, the code would have read, "TR-C-wono," or possibly "TR-O-wono."

New terms can readily be added to any of the three codes, and code letters assigned. If desired, additional information can always be shown by an extension of the code. For example, the code "A-E-abno-pe" would mean that the employee was absent without permission, to conduct personal business.

The advantages of such a system over methods which arbitrarily assign numbers or letters is rather obvious.

Below are some rather pointed questions on the turnover problem. These are not to be answered lightly by a yes or no, but should rather be carefully considered one by one. An executive might believe, for instance, that the wage scale equals the average scale of the community, or that production could not be maintained if the working hours were decreased. But is he sure? The reader who answers each item, and then questions the validity of his own answer will profit considerably.

SOME POINTED QUESTIONS ON THE TURNOVER PROBLEM

EARNINGS

1. Does our wage scale equal the average of the community?
2. Do we compensate for skill?
3. Do we compensate for responsibility?
4. Do we compensate for physical strain?
5. Do we pay enough to make the worker *desire*, as well as willing, to work?
6. Can we avoid lay-offs?
7. Would bonuses, or profit sharing, decrease turnover?

HOURS

1. Could we maintain production under reduced hours?
2. Would rest periods aid production?
3. Can we eliminate overtime?
4. Are men excessively fatigued at the end of the day?
5. Are men "all in" at the end of the week?

6. Do most accidents occur at the end of the morning; afternoon; of the week?

WORKING CONDITIONS

1. Is ventilation as good as can be secured?
2. Is lighting sufficient in all spots?
3. Can temperature and humidity be regulated?
4. Are working conditions safe?
5. Are working conditions hygienic?
6. Do we have medical, safety and hygiene inspection?
7. Are foremen and workmen on good terms?
8. Is scheduling of work faulty?
9. Are tools and equipment adequate?
10. Would time and motion studies be helpful?
11. Could helpers be used advantageously?

OPPORTUNITY

1. Have we established definite lines of promotion?
2. Does every employee know what his next step can be?
3. Do we know the qualifications of every worker?
4. Do we know the working efficiency of each employee?
5. Do we train men for superior positions?
6. Do we fill vacancies from our own workers?
7. Do we have sick, death, and pension benefits?
8. Would stock purchasing, home owning, or service buttons decrease turnover?

PROPER SELECTION

1. Have we made an *adequate* job analysis?
2. Do we *use* the personnel specifications in requisitioning and in selection?
3. Do we tell applicants the disagreeable features of each job?
4. Have we consciously developed sources of supply?

5. Is every applicant given courteous treatment?
6. Is the medical examination constructive or destructive?
7. Are selective tests not feasible?
8. Are new employees introduced to foremen and fellow workers?

SUMMARY

1. Have we analyzed reasons for leaving into *indivisible,* unit causes?

The bases for computing turnover are about as numerous as the causes. Some consider the turnover index as the ratio of the number of men replaced to the average number on the payroll. Others regard it as a ratio between the number of men who *leave* and the average number on the payroll. Still others substitute for the payroll figure the average attendance. The use of replacements is probably inadequate, for there are no replacements when the force is decreased intentionally or when it is increased with no terminations. The common method is one which has already been given, i. e., the ratio of separations to the average payroll, and has been agreed to by Royal Meeker, Daniel Bloomfield, L. P. Alford and other authorities. We can express this relation by the use of a very simple formula.

Let T = turnover
A = average on payroll for period
L = loses

Then $T = \frac{L}{A}$

Example: $A = 1{,}000$
$L = 800$
Then $T = \frac{800}{1{,}000}$ or 80%

Many employment directors assert that the only object in obtaining an index of labor turnover is to discover that loss of man power which can be *avoided.* Accordingly, they subtract the unaviodable losses(U) from the total of losses, and the formula then becomes

$$T = \frac{L - U}{A} \qquad \text{Example: } A = 1{,}000,\ L = 800,\ U = 100,\ \text{Then } T = 70\%$$

There are many other formulas in use. An investigator recently calculated the turnover of one concern by using all the known formulas, and found the index to vary from about forty per cent to over one hundred per cent. His results show the uselessness of attempting to compare the index of one concern with that of another. The turnover ratio is only useful in a single plant for a week-to-week or month-to-month comparison with results obtained by the use of the same formula. Comparison of turnover indexes of different concerns is very rough at best. It is usually best to express turnover for any period in terms of the year. Thus, a turnover of two per cent. for a certain week would be expressed as an index of 104 per cent. Undoubtedly attendance and increasing or decreasing force are factors which should be taken into consideration, but until such time as we are willing to use a complicated formula like that suggested by Carl Barth,[1] the employment director will do well to use an accepted simple formula.

Complete records of turnover are essential for an adequate study. As has already been suggested, the analysis of causes of turnover is a research task. Such analysis should be made on the bases of departments, divisions, foremen, wages, jobs, sex, age, nationality, length of service, season, distance of plant from the worker's home and similar classifications. In connection with many of these, it is not sufficient simply to state a proportion of turnover which a particular group occupies. For instance, to show that fifty per cent of those leaving are of Italian birth means little unless we know what per cent of the total working force is of Italian birth.

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[1] The Mathematics of Labor Turnover. Carl G. Barth. Industrial Management, April, 1920.

The cost of turnover represents an entirely different study from that of the causes. One significance of the cost is to indicate what amount may well be spent to reduce turnover and to increase efficiency. The employer cannot consider himself justified in spending large sums for the training of his workers if those workers do not remain long enough for him to secure a proper return on his investment. Some authorities have stated that three-quarters of the turnover is due to causes which lie outside of the factory activity. If this is true, then the employer must invest money in attacking those outside causes, or in counteracting their influences.

Many of the items which enter into the cost of turnover can be definitely calculated, but many others can only be approximated. Until such time as a clear cut system of cost accounting for labor turnover shall be devised, the methods of other investigators must be used. It seems fairly certain that we can break up the cost into three parts: the cost to the employer, the cost to the employee, and the cost to the community as a whole.

Slichter, in his Turnover of Factory Labor, divides the cost to the employer into the cost of breaking in the new man, and the limitations to the amount which the employer may safely invest in training, with reduced output from this limitation. This second factor has usually not been considered by investigators in this field. The cost of hiring includes the expenses of the employment division and part of the expenses of the health and research divisions. The training expense for new men will comprise the training division, (save the upgrading of old employees), plus the value of the time of a foreman or other instructor. Still another factor is the extra labor cost caused by the worker's decreased production. Other considerations are the extra power, lubrication and materials used; the cost of work spoiled by the new operatives above the normal spoilage; the profits which would have been realized if the company were able to take on orders to capacity; the interest, depreciation, insurance, taxes and repairs on all plant investment necessary because of lessened output; the greater wear and tear on machinery; the increased cost of accidents, due mostly to unfamiliarity and nervousness—an important item if the employer carries his own insurance risks; and, finally, the loss of good will and business due to poorer service or to inferior quality of the product. The foregoing rather impressive list of items includes practically all factors which enter into the cost of inducting and training the new employee.

In computing the cost of breaking in a new man, there are a few pitfalls which should be avoided. It should not be assumed that every man hired requires the full amount of training and therefore necessitates the entire training cost. A lower starting wage is often paid during the breaking-in period, which decreases the extra labor cost. The entire overhead charge on new equipment which must be purchased because of inexperienced workers should be spread over the cost of breaking in new men, but new workers should share the same as old employees in the distribution of other overhead. From ten to fifty per cent of "new" employees will be those who have worked previously in the concern or who have had exactly the same experience in other concerns. The cost of breaking in such men is not so great as that for inexperienced men. Some men stay but a few days, and do not therefore cost so much as those who stay longer, receive more training, spoil more work, and cause greater aggregate wear and tear to machinery. It is dangerous to calculate the *average* cost of turnover, and to use it thereafter by simply multiplying by the number of terminations. This practice becomes safer when the average has been established as the result of careful study based on thousands of cases and extending over several years or more.

Many employers are not particularly interested in the losses which turnover inflicts upon the worker. But the employer can put this knowledge to good use. If he can make his employees realize just what they lose by constant shifting from place to place, he increases their chances of remaining with him. The factors which enter into the cost of turnover to the employee may briefly be listed as follows:

1. The expense and difficulty of getting a new job.
2. The loss of earnings in the period of unemployment.
3. Often the discarding of previous experience.
4. The cost of moving his family, if necessary.
5. The decreased earnings while learning the new job.
6. The loss of ambition due to idleness and floating.

The community as a whole suffers from what has well been called the "silent strike". Since turnover results in decreased production, there is less production per capita and consequently increased cost of the product. The loss of morale among workers becomes a group matter, often resulting in dissipation, aversion to continuous employment, or Bolshevistic tendencies. Some one, or some group, must support workers during the period of unemployment. Increased accidents mean decreased production and more disabled men to be supported. The loss of skill by workers who change from one kind of work to another causes an attendant loss to the community as a whole.

The ideal method of computing the cost of labor turnover is to collect data over a long period of time from complete records. But usually this is impossible. An alternative method is to follow up new workers on different kinds of work and to find out the costs which they involve. Later it should be noted whether they become average, better than average, or poorer than average producers. By this means some estimate can be obtained of the cost of breaking in an average worker on various types of work.

Labor loss is not synonymous with labor turnover. The former represents the loss in production and costs due to failure to maintain the standard working force at normal efficiency. The standard working force is taken to mean that force which is required to operate the business most efficiently, and may be more or less than the number on the payroll. The employer loses when he has an excess of labor as well as when he has a deficit. The factor of labor turnover usually causes the number on the payroll to be less than the standard working force. Similarly poor attendance and lateness mean fewer man-power-hours. Turnover, attendance and lateness constitute the main factors in labor loss—there are many others, such as inadequate lighting and ventilation, faulty scheduling, and inefficient methods in general. Just as labor turnover should be studied in great detail, so should the other factors which enter into labor loss be analyzed carefully and remedies tried.

The problems of attendance and lateness are usually quite perplexing. Each should be studied in its relation to weather conditions, season of the year, transportation facilities, department, occupation, overtime, accidents, age, sex, nationality, etc. As a result of such study, there will usually be indicated underlying causes which should be attacked by the personnel department as a whole. Labor loss is a research task and not one like turnover, which can be summed up in an index and placed before the chief executive. It is none the less a vital problem for the personnel organization.

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CHAPTER V

ORGANIZING THE PERSONNEL DEPARTMENT

Of primary importance in the development of a personnel department is a sharp definition of its duties and responsibilities. It is, of course, practically impossible to settle these beforehand and to expect that the department will develop to just fill, in every respect, the outlines set for it. Some expected duties will never be exercised, some will grow to considerable size. In the course of normal growth, still others will necessarily be added. The chief executive of the organization should set down *in writing* the initial scope of the personnel work, and should be willing to alter his dictates from time to time. Such action will save the personnel manager much friction, particularly if the department is expanding rapidly.

If the scope of the personnel department is to include the entire working force, as it logically should, the personnel manager should be responsible to the general manager or other chief executive, and not to a department head. Personnel investments will yield returns in direct proportion to the responsibility placed upon a competent executive, and to the warm support which is accorded his efforts. Practice has shown that the centralizing of the human engineering problem has been least successful when it was regarded as mere insurance against labor troubles and placed in the hands of a minor executive, and has been most successful when recognized as of comparable importance with problems of production, finance or sales, and so placed in the hands of a mature executive of vice-president calibre.

The personnel manager must coordinate the work of his department with other departments and individuals. Employment is still the main basis of most personnel departments—and the employment function was taken from foremen, leaving them quite antagonistic to the newfangled employment department. Since the foremen are in contact with the workers all day long, they have always been, and still are, one of the most powerful sources of irritation or contentment. The personnel manager must secure the loyal support of foremen, and at the same time train them to better methods of handling men. Either one of these might readily be accomplished without the other, but the combination of the two is absolutely essential.

In a similar way the personnel manager must sell his work to department heads and to other executives. Just as the foreman was certain that no one could select pipe fitters better than he, so will the head accountant and the chief stenographer insist that they alone are competent to select their assistants. A similar statement is made concerning the training of these assistants when selected. It is usually a wise policy for the personnel manager to call upon those who have been engaged in the selection and training of workers to assist him in devising methods of selection and training for those workers. We have failed to do this with foremen, so that a considerable mass of valuable knowledge has been lost or disdained by a foolishly superior attitude. It has been but recently, in connection with the formation of trade tests, personnel specifications and training courses, that personnel executives have realized the necessity and value of seeking information from foremen and department executives. As department heads are relieved of various employment. training and follow-up functions, advantage should be taken of the errors incurred in connection with the removal of such powers from foremen. To ask for advice and suggestions from those who have had experience in the activities undertaken flatters the individuals asked, and is furthermore quite the common sense thing to do to secure the best information.

The personnel department has arisen because of the need to bridge the widening gap of personal relations between the employer and the individuals employed. So far the foundations only of such a bridge have been laid. Personnel work of to-day is a negative aspect of what the stituation should be: it enters at issues only. The reverse condition should obtain. Like the physicians of the Orient who are paid on the basis of the number of patients who remain in health, the personnel department should be most noticeable when no issues are paramount. In order that this condition may hold, it is necessary that there be personal relationships with each worker *all the time.*

The realization of this need is not a new one, as evidenced by the titles of many personnel departments: personal relations, human relations and the like. But the actual institution of methods to meet the need is comparatively embryonic. Some companies are placing representatives from the personnel department in shop and office. Others are training their foremen in better methods of handling men. Still others detail their foremen, one by one, to duty in the personnel department for a month or so, hoping in this way to implant the right attitude in the foreman and to promote his cooperation with the department. To some this may seem like dangerous decentralization of the personnel functions. In reality, however, it should be regarded merely as the digging of channels of interplay between management and the worker-in-his-work.

But the personnel department is concerned, not only with the worker-in-his-work, but also with the worker as a human being. The employer who regards such statements as the foregoing as "all tommyrot" has yet to learn much regarding the art of handling men, no matter how ponderous his profit sheet may be. In recognition of the obligation of the employer toward the entire life of the worker, and of the absolute value of so doing, many large concerns are taking part in welfare and community betterment work. The reaction on those engaged in such work is often a very valuable by-product. The writer was recently very much interested in observing the installation of Americanization work in a large plant employing low grade labor. Members of the personnel department were most anxious to volunteer some aid in the work. One young woman told the writer that she always stayed to help the five-thirty class, even though it made her late for supper!

The aim of the personnel department is to select and to retain competent workers. In doing this its problems are the old ones of *what* and *how*. It contributes little that was not already existent in the organization. Employment and labor maintenance are certainly not new business operations—the personnel department merely centralizes what has hitherto been handled but indifferently. We are coming to realize that the employment problem becomes less perplexing as the maintenance methods become more effective. This realization has brought ever increasing stress on the retention aspect of personnel management, contrasting sharply with the older viewpoint which held personnel management and employment management to be synonymous fields.

Logically, then the personnel department should be divided into the division of employment, and the division of maintenance, with a research division to act as an advisory staff. In practice, the maintenance work is usually split up into training, safety, medical, welfare and similar parts. The five divisions used in this book are somewhat arbitrary, but succeed in splitting personnel activities into sharply defined parts, as indicated in the accompanying chart. (Fig. 13)

In addition to directing the activities of the five divisions under him, the personnel manager must coordinate the work of his department with the rest of the organization, and must decide general policies within his power, such as wage adjustments, rest periods and the like. Both coordination and policy making belong distinctly to the personnel manager, and not to any one of his assistants.

The organization of each division of the personnel department will be considered in detail later. Just as the personnel manager should have written authority and responsibility from the general manager, so should each of the directors of the five divisions have written instructions concerning his duties, and his relations with the heads of other divisions. This simple safeguard will prevent considerable friction, and will allow each director to perform his duties with assurance. It furthermore enables the personnel manager to demand definite results from definite quarters. Clerks and stenographers should not be responsible to two or more directors, even though it is necessary that they perform work for more than one. Lines of promotion within the personnel department should be established and made known. The personnel manager can hardly expect to maintain contentment in the ranks of the plant working force if the very workers under him are discontented and lacking in the spirit of cooperation and harmony which he is attempting to spread throughout the company.

In a well organized personnel department there will necessarily be considerable paper work. To handle this, there should be a system of centralized files. These files

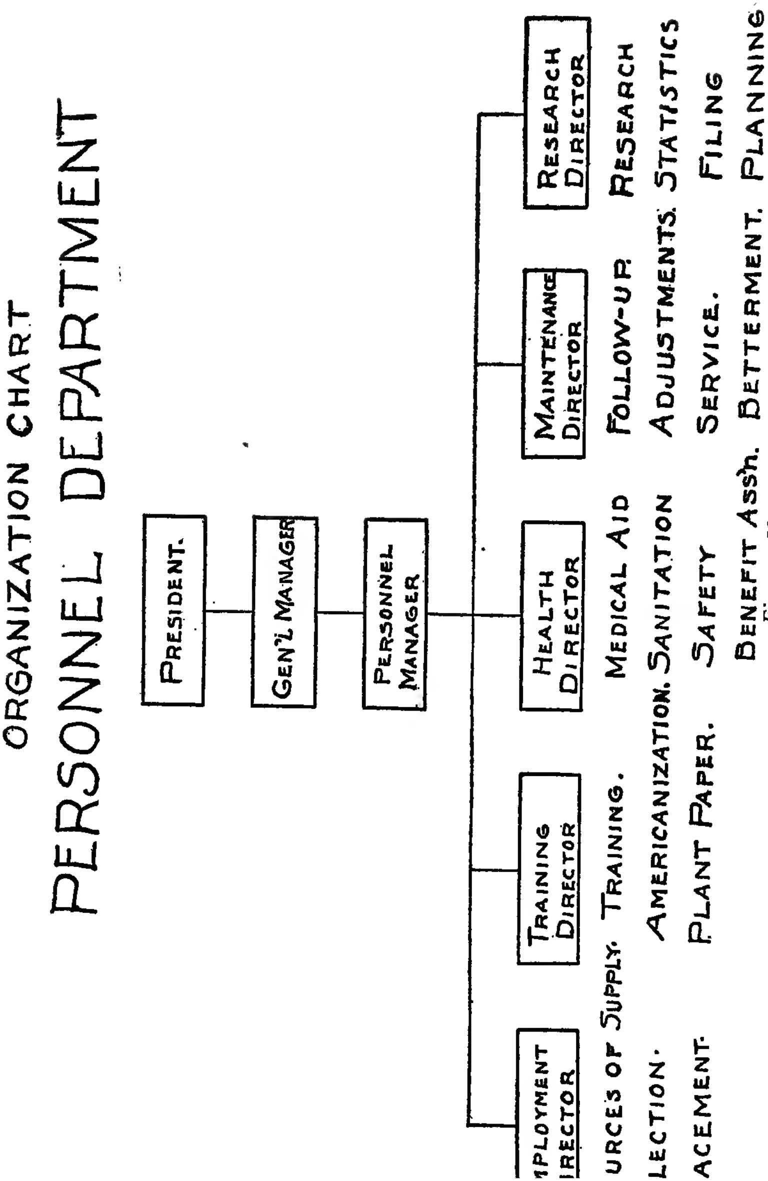
ORGANIZATION CHART
PERSONNEL DEPARTMENT
PRESIDENT.
GEN'L MANAGER
PERSONNEL MANAGER
MPLOYMENT IRECTOR
URCES OF SUPPLY.
LECTION.
ACEMENT.
TRAINING DIRECTOR
TRAINING.
AMERICANIZATION.
PLANT PAPER.
HEALTH DIRECTOR
MEDICAL AID
SANITATION
SAFETY
BENEFIT ASS'N.
MAINTENANCE DIRECTOR
FOLLOW-UP.
ADJUSTMENTS.
SERVICE.
BETTERMENT.
RESEARCH DIRECTOR
RESEARCH
STATISTICS
FILING
PLANNING

Figure 13

should include all records which will be used by more than one person in the department. Records which are for the convenience of one person only should be filed at the desk of that person. A charting of the routing of personnel records will usually clarify the record system for all parties concerned, particularly for newcomers. The accompanying chart (Fig. 14) is suggestive, but may not apply in all cases.

ROUTING OF PERSONNEL RECORDS

Record	Foreman	Applicant	Physician	Tester	Interviewer	Training Division	Time and Cost Cl.	Maintenance Division	File Clerk
Requisition..........	O..	.....	.....	.....	..U..	.....	.....	.....	.E
Application..........		O..	.....	.....	..U..	.....	.....	.....	.E
Medical records.....			O..	.....	..U..	.....	.....	.....	.E
Test records........				O..	..U..	.....	.....	.....	.E
Qualification card...					O..	.....	.....	.....	.E
Training records....						O..	.....	.U..	.E
Attendance; lateness							O..	..U..	.E
Production records..							O..	..U.	.E
Efficiency ratings....	O..	.....	.....	.....	.....	.....	.....	..U.	.E
Quit slip...........	O..	.....	.....	.....	.....	.....	.....	..U..	.E

O—record originates U—record used E—record ends

Figure 14

The physical arrangement of the personnel department is an important consideration. The building or room in which the department is housed is, of course, a limiting factor. If a new building is contemplated, the personnel manager can well afford to devote careful thought to the proper planning. After he has decided exactly what features will be included, the relative spaces necessary for each feature, and the possibilities of expansion, he should consult with a competent architect. It is very seldom, indeed, that an inexperienced person can lay out plans for even the simplest of buildings which will later prove satisfactory. The advice of a competent specialist is usually worth all it costs.

A simple method of preliminary designing of the personnel department is to assume that there is a space of 100 square feet to be apportioned among the five divisions, plus space for the manager's office, washrooms, storerooms, central files, etc. Such an area can be represented on graph paper, wherein each square equals one square foot, and tentative spaces allotted. The actual spaces included under each main division will, then, express the per cent of the actual area to be assigned to each division. These per cents will vary widely in different concerns. The training division, for instance, may require but a small office if instruction is given on the job, or in classes held elsewhere. Similarly, the health division may need considerable space if periodic physical examinations are held. The following percentages proved satisfactory in one concern employing nearly ten thousand workers.

PERSONNEL DEPARTMENT

Percentage Assignment of Space	%
Employment Division	35
Training Division	5
Health Division	15
Maintenance Division	10
Research Division	5
Manager's Office	10
Washrooms	10
Storerooms	2
Central Files	8

After this general space allotment, each division can be further subdivided. For instance, the employment division might be broken up into a waiting room, an interviewing section, a testing section and the office of the employment director. Places like the waiting room, washrooms, and storeroom should be placed in the poorly illuminated corners, so that offices where close eyework is necessary may receive the maximum of natural light. Files should be located centrally, so that they may be most accessible.

The equipment of the personnel department will follow the general line of all office equipment. But there should be additional features. The tester may require materials for mental and skill tests. The physician should be urged to install fairly complete apparatus for both measurement and treatment. The director of training may need elaborate machinery and tools to carry on his work. The research director will evolve strange wants. The work of the maintenance director may demand anything from a Bible, for legal affirmation, to a baseball bat.

The walls of the personnel department may be made to serve a useful purpose in advertising the company and its policies to waiting applicants. The possibilities of playing on the company baseball team or of eating a warm dinner in the company restaurant may outweigh in the applicant's mind a competing firm's higher wage scale. Since it is the first impression which a prospective employee receives of the company, the personnel department should present a general appearance of neatness, activity and comfort. Bare whitewashed walls, crude benches, foul-mouthed interviewers, dust, dirty toilet rooms and the like will give the majority of observing applicants an attitude that may never be changed. Let the reader think back over the waiting rooms of various business offices, and realize how they have colored his attitude toward those businesses.

Managing the selection and maintenance of the working force is a big problem, fit for a "big" man. It cannot be too often repeated that returns from personnel work are in direct proportion to the time and money invested in it. If one could calculate it in dollars and cents, the size of the return would be found to be dependent upon the character and ability of the personnel manager.

Perhaps even to-day, the mistake is made of selecting as foreman the most skilled worker. The absurdity of assuming that a man who can manage tools well will necessarily be able to manage men well has become evident. But the same error is often made in selecting the personnel manager or his assistants. A graduate engineer, or a proficient workman, or a capable stenographer is put in charge of employment, or training, or maintenance—often with disappointing results. In such instance, management should not proceed to damn personnel work. Rather should it ask whether those who were in charge were particularly qualified for the work. Would those same individuals be placed in charge of advertising, sales, efficiency or chemical research without having had previous experience in these lines, and without having exceptional bent for them?

The selection of the personnel manager is, then, a very important issue. The salary will determine to a large extent the calibre of the man who can be secured. A large organization can hardly hope to secure for, say, three thousand dollars per year, a man who can meet the sales or production manager on a level, when the latter are receiving five or ten thousand per year. Nor, from the very limitation thereby placed at the top of the personnel organization, is it to be expected that the staff of the personnel manager will be of the finest—quite often he finds himself surrounded with but petty clerks. Aside from the salary which is paid the personnel executive, the authority which is invested in him will determine to a great extent the degree of his success. If he is simply directing the routine machinery of the personnel department, he is a mere administrator in the narrow sense, and not an executive. Finally, the real determining factor is the presence, or lack, of backing from the powers higher up. The attitude of the chief executive is quickly sensed by superintendents and department heads, and will be reflected by them. If the chief executive gives vigorous support to the first few moves of the personnel manager, the way will be paved for the introduction of future policies without involving continued attention from the general manager or president.

Accompanying is a specification for the personnel manager. It is quite possible that an individual might be found who would meet every requirement of this specification, and yet fail to make good. But it is not probable. On the other hand, any one under consideration who failed materially to live up to most of the requirements here set forth would have rather slim chances of success. The same two generalizations will hold true for all personnel specifications, at the present stage of their development.

PERSONNEL SPECIFICATION

PAYROLL TITLE Personnel Manager

IMMEDIATE SUPERIOR General Manager

NUMBER OF SUBORDINATES 34

DESCRIPTION OF JOB DUTIES

Directs the activities of the five divisions of the personnel department: employment, training, health, maintenance and research. Submits policies of personnel to the general manager for approval, and puts them into effect when approved. Coordinates the personnel department with other departments of business, and with outside personnel agencies.

NATURE AND CONDITIONS OF WORK.

Executive; office work.

MAN REQUIREMENTS

Physical—average office physique, or better.

Age—30 to 55 years.

Intelligence—above average: A, B, or C+

Education—at least high school—college graduate preferred. Should have specialized in economics, engineering, psychology, business or education.

Temperament—directive, aggressive, just, even-tempered.

Social qualities—tactful, congenial, sympathetic, a good mixer.

Experience—active personnel work two years or more; general administrative work two years or more; social activities. Knowledge of details of business and of training principles desirable. Should understand efficient organization and principles of management. Must understand labor conditions and trends.

Particularly when he initiates the personnel work must the personnel manager be a salesman. He is selling his work to three groups: executives, employees and applicants. Quite often the executives and foremen are antagonistic because the power of hiring and firing has been taken from them. They must be convinced that the new department stands ready to cooperate with them and to supply better selected and better trained men. The old employees will usually look with suspicious eyes upon the new fangled scheme, particularly if it involves radically new methods, such as the use of a time card where such had not previously been in use. Finally, new employees must be secured, which means the selling of the benefits of employment to applicants.

The first of these three "selling" problems is often the most difficult but can readily be made the most simple. Some concerns have succeeded in inaugurating personnel work, not only without opposition from executives, but with their hearty support. A conference of foremen and department heads over the dinner table will usually give the proper setting. The general manager should preside over this conference in person. He should state the value of centralization of duties, and show the cost of labor turnover. Then he can suggest his intention to establish a personnel department to be responsible for the selection and maintenance of the entire working force, but request frank discussion before such a move is made. The prospective personnel manager might well be introduced at this juncture, and given time to express the benefits of personnel work to foremen and department heads. A free discussion, tactfully guided by the general manager, will usually end in a satisfactory feeling to all parties concerned.

Immediately after this meeting, the general manager should issue a general order establishing the personnel department, and outlining the duties and responsibilities of the new department. Copies of this order should be placed on the bulletin boards and sent to all executives.

In selling the personnel organization to employees, there are two general principles to be observed. Men are naturally inert and therefore resent changes which cause them to do things differently. Accordingly, the first changes attempted should be those which affect the individual worker the least. No present employee would oppose the sudden introduction of a thorough physical examination of all new *applicants.* Such method of introducing this innovation would anticipate, and to some extent prevent, the later opposition, when the same thorough examination is given periodically to every employee. The second general principle to be followed is that workers must realize the benefits resulting from each particular change before they are asked, or even permitted, to participate in the change. For instance, training work will be undertaken eagerly by old employees when they see new employees who have received such training earn more than they themselves.

In practice, it is often impossible to follow out the two principles given. Perhaps the worker will not be convinced that keeping account of his lateness, or changing the basis of a piece rate, or moving his bench to a better lighted corner, are good things for him. But the closest possible adherence to the two principles will mean the minimum of that friction which attends the introduction of new methods. The ideal way is, of course, to have the workman himself absolutely demand the contemplated change.

Selling the personnel department to prospective employees is a somewhat different problem from the other two, and really amounts to selling the benefits of the entire organization. This work may be apportioned in great part to the various divisions. Training, bonuses, working conditions, restaurants, athletic teams, dancing, housing and the like are all selling points to be used in the personal interview, the plant paper, or even in magazine or newspaper articles. Paternalism is properly resented by most workmen, but features which add opportunity, comfort, health and recreation to the work-life are usually appreciated.

Most personnel departments have grown out of centralized employment, and are still called employment departments, regardless of the fact that they embrace training work and various forms of maintenance. But where an entire personnel department is to be installed, or where a sudden expansion of the employment department is contemplated, there is a fairly definite order of procedure which can be laid down. It must be kept in mind that the personnel department is invariably a thing of growth ,and never a blanket installation, and furthermore that its various divisions will develop parallel and never in sequence. The personnel manager can never tell himself that the employment division being perfect, he will next undertake to perfect a training division.

We have already noted that the unqualified support of the highest authority is the first step in the formation of the personnel department. This support should include, if possible, the hearty cooperation of other executives and of the employees, and should be accompanied by written definition of the relations between the department and the rest of the organization. The selection of a competent staff to support the personnel head is the next logical step. When this has been accomplished, a personnel audit of the entire company should be made. The personnel specifications, and the uncovered qualifications of each employee which result from the personnel audit, supply bases for the establishing of each of the five divisions. In turn, the creation of these divisions requires the devising of a personnel system which allows for future expansion.

The personnel department should never be *complete.* It must adjust itself to changing conditions. A new feature may be added here—an old one dropped there. There is no progress without change. The development of personnel work to a semblance of stability and maturity is a long time process, requiring years of vigilant supervision. The general manager would not expect immediate results from a new sales manager, starting work with an entirely new sales force to sell a new product. The analogy holds.

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CHAPTER VI

THE EMPLOYMENT PROCESS

In this chapter the employment division will be considered in its narrowest meaning as merely that section of the personnel department which, upon authority of the requisition, brings the human material to the plant, and carefully selects it according to specification. *All* men joining the company should be passed through the employment record routine, whether actually hired by the employment division or not. Otherwise, tabulations of turnover and similar conditions become invalid.

Just as the purchasing agent finds it necessary to uncover sources of raw materials, to gage the value of these sources and to establish personal relations with them, so should the employment director carefully develop sources of labor supply. In most large plants too much reliance is placed upon the impersonal want ad, and too little time spent in opening up more intimate channels. The latter is becoming increasingly necessary. Several decades ago, when there were more men than jobs, the employer stood a fair chance of securing a good man for any particular job. To day the situation is exactly reversed: there are more jobs than men to fill them. The chances of filling a high-grade position from among the floating workers who will answer a newspaper ad are not very high. Every employer has had the vexatious experience of sorting through much useless chaff to discover a very few grains of real wheat.

Not only is the quality of worker obtained from want ads somewhat doubtful, but the quantity varies immediately with fluctuations in the labor market. A young employment manager, called upon the carpet for failure to maintain the standard working force, gave as his excuse that "whenever we need men, it seems that all the other concerns need them at the same time." He had not yet learned that he could not depend upon the labor market, but that a careful development of sources of supply was essential to the stability of his working force.

When a position becomes vacant, it should be filled from the ranks of present employees if possible. If this cannot be done by direct promotion, indirect promotion of a capable man from some other department of the business is far preferable to the bringing in of an outsider. If there has been no immediate subordinate in training for the job, then the training program is lacking and should be remedied. The Gilbreth promotion plan, whereby every employee is learning the job above him, and is in turn teaching his job to someone below him, has proven quite successful in many concerns. Failure to fill positions from present employees causes discontent and repress ambition. The wide-awake employer not only depends for information upon observation of each worker, but discovers, by personal interview, the desires of each worker and the ways in which he is preparing himself for higher duties. The personnel audit invariably surprises the big executive by showing him what fine timber he already has in his organization.

If present employees are satisfied that management is giving them the square deal, they can be utilized as powerful factors in bringing their friends into the company. Good workers are influenced far more by what their friends say of an employer than by even the most glowing of advertisements. Notices posted on the bulletin boards around the plant will often suffice, but small bonuses to the employee may be necessary. The bonus may be awarded for simply bringing a friend for interview, or for each friend who is actually employed. One of the weaknesses of the bonus system is that if it is once begun, the men will expect it in the future. For many kinds of work it is better that fellow workers be total strangers, particularly if the foreman is a poor disciplinarian. Some employers are definitely opposed to the hiring of friends and relatives of present employees on the ground that such practice tends to cause the formation of cliques and to distract the interest of the worker from his work.

Former employees usually constitute a most valuable source of labor supply, for they are already acquainted with the customs and processes of the business. In many instances they have left the concern in pursuit of a rainbow that did not materialize, and would be only too glad to return if the opportunity were presented to them. The qualification card and other records of such employees should indicate causes of leaving and desirability for reëmployment. A circular letter may arouse sufficient interest, but a personal visit by a representative of the employment division, by a fellow worker or, better still, by the former superior, will prove more fruitful. One concern which built a second plant in a comparatively small town held a house warming party to which all present and former employees were invited. In this way the greater proportion of the working force for the new plant was recruited—employees already experienced in the details of the business.

A well kept file of applicants who are being considered or who have been rejected is a worth while investment. Each card in such a file represents a man who has previously shown a desire to be connected with the company. The items answered on the application blank should show whether it would be to the company's interest to communicate with the applicant. Each card should be flagged with signal tabs to indicate the kind of work desired. The applicants' file should be culled frequently, for many applications become "dead" very quickly. The length of time over which applications for various types of work should be retained will be discovered as a result of experience only, but will necessaribly vary with the grade of work. A foreman or skilled mechanic may be willing to wait months to secure the position he wants. When writing to an applicant who is desired, care should be taken, if at all possible, to arrange to see him at a time which will not conflict with his present work. This precaution is only fair to the prospective employee, and greatly increases his chances of responding to the letter even though his present position may be satisfactory. A personal visit to his home may be highly desirable. However, stealing of employees is a practice to be strongly condemned, for in the long run it does harm to all parties concerned.

Unless a concern is located in the centre of a business district, its workers will usually be drawn from the community immediately adjacent to the plant itself. Judicious advertising outside the gate, coupled with correct policies inside, can focus upon the company a favorable attitude of the community. This advertising may take many forms, such as billboards, circulars, plant paper, or participation in community activities. The simple sign at the gate will always remain effective for the lowest grades of work in times of labor surplus. In addition to the usual applicants at the gate, employment agencies in the vicinity can be utilized to secure help. If employment directors were more specific in stating their labor needs to neighboring agencies, they would usually secure better cooperation from the latter. Some few concerns have supplied reliable employment agencies such as those connected with the Y. M. C. A., or with state and civic activities, with their personnel specifications. The employment director can then ask for men by definite name or symbol and be sure that the agency director will understand the duties and requirements of each position.

Many industrial concerns have adapted jobs to women workers, to disabled men, and to older men, usually with marked success. It is claimed that turnover and unrest are greatly reduced by this practice, and that more conscientious work is secured. Carried to extreme, however, the above methods would result in a retardation of that healthy progress which is forced upon every organization by the constructively discontented younger man.

Occasionally it is necessary to secure out-of-town labor. Newspaper advertising may be necessary in such instance, for it is impossible to develop distant sources of supply to any great extent. Another method is by the use of labor scouts who recruit workers in various localities. The latter practice is falling into disrepute, for it usually amounts to wholesale robbery of the workers of other concerns. It is the very exceptional employment agency which can secure workers for distant points and really get them to their destinations. When workers in large numbers are brought from distant sources, the employer is obligated to take upon himself many difficult problems such as transportation, housing, restaurants and the like.

The schools and colleges of any locality afford one of the most valuable, and one of the most neglected, reservoirs of human material. In his eager search for *experienced* men, the employer often fails to realize that a high school or college graduate may not only be equipped to learn the particular task at hand in a few months but might also be the very timber for future executives. Employment directors should not only ask for recommendations from the various principals, deans or instructors, but should also request the scholastic record for the last year. This precaution will tend to tone down many a blanket recommendation, and will supply data for better self. Registrars of colleges will usually supply such data judgment on the part of the employment director him- as a matter of routine. The plant paper sent to the libraries of the various colleges and high schools, or even to the elementary schools, will serve to place the name of the company before students during an impressionable period. Tours of inspection through the plant will serve to arouse interest of students in the plant processes, and should be coupled with light literature explaining the nature of the work. Finally, exceptional students should be interviewed personally, and even offered inducements to specialize along certain lines of study.

There are, of course, times when it is absolutely necessary to insert want ads to secure help. The newspaper will reach far greater numbers than any other means. Nor does the carefully phrased want ad necessarily involve an undue proportion of floaters and undesirables. Advertisements in trade journals are particularly liable to bring good results. But the wholesale practice of using want ads as the sole means of getting men before the interviewer is to be condemned strongly, for it is unnecessary and in general fails to yield the best material.

The close analogy between the purchasing of raw materials and the securing of competent help has already been pointed out. In either instance, standard requisitioning and careful selection is made possible *only* by the use of detailed specifications.

The requisition for help is usually made out by the foreman or department head in duplicate or triplicate. Different colored paper shows for whom each copy is intended. The executive who makes out the requisition retains one copy for his own files, and the others are sent to the employment office. Here the practice varies in different concerns, but a copy of the requisition is invariably supplied the interviewer. A large manufacturer of electrical parts insists that a requisition slip be made out for each type of work so that when the requisitions are received in the employment department, hiring specifications for each distinct position are clipped to the requisitions. This method is an attempt to bring about the proper utilization of expensive personnel specifications.

The items included on the requisition for help vary in direct relation to the usefulness of the personnel specification. It may only be necessary for the department head to write "3B—M" to secure three clerks for machine billing. On the other hand, if proper specifications have never been formulated, the same executive may invest precious minutes in covering such items as the rate of pay, the age desired, etc. The good labor requisition contains very few items and is supplemented by a complete personnel specification. Following is a list of headings found on various requisitions in current use.

REQUISITION ITEMS

Name of record.
Serial number of requisition.
Date made out.
Number of workers needed; name or code of job.
Date when needed.
Reason for need: addition to force; replacement; replacing whom; reason for vacancy.
Method and rate of pay; hours of work; chances of advancement.
If temporary work, how long?
Special qualifications; age and sex desired.
Remarks.
Names suggested.

Need men from training division?
Name of department, or sub-department.
Number of building; floor; room.
Signature of requisitioner; title of job.
Approval of superintendent.

The application blank should not be confused with the qualification card, although in actual practice the two may be identical. The former record is made out by an applicant and is used as a means to determine whether he should be interviewed further. Usually preliminary weeding out of applicants can be done by an information clerk who informs would-be employees as to the kinds of positions open, aids in filling out application blanks, supplies general information and directs likely applicants to the proper interviewers. If it is decided that the applicant is desirable, a qualification card is filled out by a trained interviewer. These two steps constitute the accepted procedure in most concerns but practice must necessarily vary with the conditions of employment and with the kind of labor, so that it is impossible to lay down an absolute routine. Where low grade help is being hired, the applicant cannot be expected to fill out his own application blank. A well known publishing company, employing a large clerical force, uses a small application card in a visible file as the sole record of employment and identification. Other firms insist that, no matter how humble the worker may be, a detailed qualification card shall be filled out for him, so that his abilities and progress may be carefully noted.

If a qualification card is used in addition to the application blank, the data on the latter should be as simple as possible. There will necessarily be duplication of items on the two records—such duplication should be made a minimum. The name, address, kind of work desired, extent of education and experience, and three references constitute the usual basic data for application blanks. Other items may, of course, be added to meet particular conditions.

Many employers question the value of references, for the applicant will naturally list names of those who will give favorable recommendation. Greater reliance is to be placed upon the comments of former employers. If such employer has a well organized personnel department, there will usually be an established routine for yielding the desired information. In order to facilitate the recording of essential points by a former employer, many employment directors use a form letter in which various items can be checked. The following is typical, and may be used to communicate with schools and character references as well as with former employers.

June 1, 1920.

Montger, Green & Co.,
New York, N. Y.

Gentlemen:

Mr. ....of
....
has applied to us for a position as ...., and has given your name as reference. We should appreciate your careful consideration of the questions listed below. An addressed envelope is enclosed for your reply.

We wish to assure you that your answers will be regarded as absolutely confidential. If at any time we can reciprocate your kindness, we shall be only too glad to do so.

Very truly yours,

. ...

Employment Director.

(Wherever possible, simply check appropriate bracket)

1. Were you personally acquainted with him? Yes ( ) No ( )
2. Applicant's monthly salary was approximately $...... per month.

3. Applicant's length of service with you was approximately ...... years .... months.
4. Applicant left your employ voluntarily or involuntarily because ....
5. Would you reemploy him? Yes ( ) No ( )

Rating

	Deficient	Poor	Average	Good	Excellent
Education	( )	( )	( )	( )	( )
Energy	( )	( )	( )	( )	( )
Intelligence	( )	( )	( )	( )	( )
Knowledge of work	( )	( )	( )	( )	( )
General value	( )	( )	( )	( )	( )

We should appreciate any comments that will assist us in judging the applicant's fitness for a position in our employ. The space below is left for this purpose.

The interviewing process naturally depends in great part upon the skill of the interviewers. A careful sequence may be planned and elaborate tests installed but these can never compensate for overbearing, tactless interviewers. It is usually best that men interview men and women interview women. The purpose of the interview is twofold. Not only is the employer trying to obtain certain personal—often delicate—information from the prospective employee, but the latter is crystallizing his concept of the work to be done, and of the company as a whole. The possibilities of a job should preferably be underrated to the applicant. Many a worthy man has been lost by the "take it, or get t'ell out" attitude of a harsh interviewer. That the interview should be private and not within the hearing of dozens of other applicants would seem to be self-evident.

It is a wise practice to devise an Interviewer's Manual which contains suggestions for interviewers, general information concerning the company and its policies, personnel specifications, diagrams of the employment routine, training and recreation facilities, and similar valuable data. These manuals should be distributed to foremen and department heads to aid them in making requisitions and to give them a better understanding of the work of the personnel department.

One company which employed considerable foreign labor had the necessary interviewing phrases translated into the several foreign tongues, with the proper pronunciation indicated, as shown in the following excepts.

ITALIAN PHRASES FOR INTERVIEWERS[1]

What is your name?
    Quale e il vostro nome?
    Kwaálay ay eel vosstro nomay?
Write it on this paper.
    Scrivete lo su questo pezzo di carta.
    Skreevaýtay-lo soo kwésto paytso dee cařta.

The qualification card is the permanent record of the interview. On it the interviewer records the information considered necessary and, usually, his personal opinion of the candidate. The Blackford system of observation is used by some interviewers. Disregarding the much disputed question as to whether her system is based on fundamental fallacies or not, it is certain that in practice interviewers seldom agree and results cannot be expressed in quantitative terms. The Scott rating scale attempts to overcome these difficulties and will be discussed in a later chapter.

The items found on qualification cards vary from the texture of the applicant's hair to the size of the mortgage on his home. The following list contains various items which should be of assistance in devising a qualification card.

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[1] These phrases used by courtesy of Mr. Francesco Petrilli, interpreter for the employment division, Atlantic Refining Company.

QUALIFICATION CARD ITEMS

General record information
  Name of record; date made out.
  Articles loaned to employee: locker key, etc.
  Signed agreement to various provisions: benefit funds, discipline, notice of termination, etc.
Personal data
  Identity: name; check number; address; telephone number; date and place of birth; age; sex; color; photograph
  Social connections: membership in trade union, professional, or fraternal organizations; citizen, non-citizen, first papers; religious preference.
  Home conditions: single, married, widowed, divorced, separated; address of wife (or parents); number of children under 16; other dependents; board, rent, own home in full, own home in part.
Record previous to employment
  Schooling: nature and extent; specialization; speak, read or write English.
  Experience: kind of work, name and address of employer, length of service, salary at leaving.
  Name of relative or friend in company.
  Outside activities: athletics, social, hobbies, specialized abilities.
  Record of mental or skill tests. (See Chapter VII)
  Interviewers' ratings. (See Chapter VIII)
  Medical examination. (See Chapter X)
  List of company jobs. Checked to indicate applicant's knowledge of them.
  References.
    Preference of work with company—first, second and third choices; location; salary to start.
Record with company
  (Considered in Chapter XI)
Remarks

The arrangement of the items on the qualification card is an important consideration. The general principle to be observed is that the information should be located for the maximum convenience of those who will use the card, and not necessarily for the convenience of the interviewer who handles the card but once. Space should be left for change of address, of work, etc. The items previously listed are suggestive only—the final data should be worked out on the job, utilizing foremen, workers and, most of all, the personnel specifications.

The employment director who is acquainted with the general principles of designing cards for printing is fortunate. Such points as kinds of paper, size of the card, quality of stock, spacing, lining, etc. are very important ones to know. If it is planned to fill out the qualification card (or any other record) by use of the typewriter, the spacing between lines should be the same as that of the machine and the alignment at the left side should be vertical rather than irregular. Standard forms which have been made up by others can be used as bases, and one can profit by the experiences, pro and con, which others have had in using those same forms.

The qualification card is necessary to keep information up to date and to have definite knowledge concerning the initial qualifications and later achievements of each worker. In order to do this it is important to get up some kind of routine that shall bring in the desired information. No one arrangement can be devised which will be adaptable to all concerns nor, indeed, to all departments of one concern. Some one individual in the personnel department must be held responsible for the gathering and recording of the various cumulative data and notations of changes.

The qualification record may be in the form of folder, envelope or card. Signal tabs to denote certain qualities may be used on all three forms. The double thickness of the folder helps to compensate for the extra thickness caused by the signal tabs, which are attached to that "half" of the folder which projects above the other half. Unfortunately, the folder is liable to crack where it is creased, despite the use of long-fibred stock. The folder and envelope permit all records on one individual to be kept at one place. The single card is more convenient for filing and recording entries; the extra thickness caused by tabs may be compensated by a strip of cardboard punched to the bottom of the card. In making the record for tab indexing, it is essential that the tabbing spaces be absolutely equal in width, and equidistant from the edge of the card. It is usually wise to leave a few tabbing spaces unassigned, for important items which have not been foreseen often are revealed after the card is in use. Different colored tabs can be used for various purposes, but since colors fade or become grayish with use, it is better to use but few colors as strongly contrasted as possible.

It may not be best to keep the qualification cards centralized in one personnel office, particularly if the organization is far flung. In most concerns, if promotions are made through the personnel department, if a routine is operative to supply the necessary information, and if the personnel department is equipped to handle such information, the qualification cards should be kept centralized in the department.

Practically all companies break up the interviewing process into a preliminary and a final interview. At the former, the interviewer looks over the items on the application blank and briefly questions the applicant. If this interview is satisfactory, the applicant is given whatever mental or trade tests are necessary and finally a physical examination. The applicant may be sent to the foreman for his written approval or disapproval—the latter substantiated by definite reasons. Both the tester and the physician make definite recommendation for the use of the interviewer in the final interview. At this time the qualification card is filled out and the new employee is instructed concerning company policies, company benefits, use of locker, time card, and similar items. Locker key, identification tag and time card are given him, together with an Employees' Handbook. This handbook should include most of the following points.

CONTENT OF EMPLOYEES' HANDBOOK

1. Organization of the company; chart; list of officers and important officicials.
2. General policies toward customers.
3. Routine of the business, and relations of various departments.
4. General information.
   Terms of employment; methods of pay.
   Opportunities: promotion methods; transfer; educational facilities: benefit association plan; suggestion system; medical service; lunchroom; recreation; legal aid.
   Conduct: attendance; lateness; holidays and vacations; use of telephones; employees' councils; safety precautions; grounds for discharge.

At the time the applicant is accepted, notification of new employee is sent to the foreman, and to the time department for payroll entry. When the man reports for work, he should be taken to his place of work by a representative of the personnel department and introduced to his new foreman and fellow workers. This act completes the employment process.

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CHAPTER VII

SELECTION BY MENTAL AND SKILL TESTS

The value of mental and trade tests in industry is no longer a subject of dispute. Experience has shown that they constitute one of the most valuable assets of the personnel department. Employment directors who at first looked with great suspicion upon anything which seemed to usurp their sacred rights or suggest that there were better methods of selecting men than they themselves were using, have come to realize that tests of selection in the hands of experienced examiners, become valuable tools. In many quarters, unfortunately, tests have been oversold, so that there are to-day many exaggerated claims made for mental and trade tests. This chapter will attempt to sift these claims, and to give a clear idea of what tests can and cannot do for personnel work.

The name of Professor Münsterberg is associated with some of the earliest attempts to apply mental tests to industry. At the time, he was subjected to scathing criticism from his brother psychologists because they felt he was prostituting his science. The attitude of psychologists has changed with the realization of the vast possibilities for testing work in the industrial field. Münsterberg attempted to devise, among others, selective tests for street car motormen, and for telephone operators. If those who were doomed to failure could be eliminated at the very beginning, the cost of training would be greatly decreased, and the cost of turnover, accidents, errors and the like would be lessened. It cannot be said that the tests which Professor Münsterberg devised were highly successful in practice, but sufficient results were obtained to give confidence to other experimenters.

The name of Walter Dill Scott stands out as the second great pioneer in the movement to apply psychological tests to industry. In connection with his work as director of the Bureau of Salesmanship Research (now the Bureau of Personnel Research) at Carnegie Institute of Technology, Dr. Scott devised various tests for the scientific selection of salesmen. A realization of the inadequacy of the usual selective methods was forced upon him by the high turnover among salespeople, by the proven deceptiveness of an applicant's appearance and previous experience, and by the lack of agreement among competent judges who interviewed men for sales positions. He successfully demonstrated that men selected by tests stayed longer than those selected otherwise, and attained their assigned sales quotas more often.

There are five main types of tests which can be used in employment work. A miniature model of the work to be done can be constructed, and the applicant requested to perform the work in miniature. For example, a pipe fitter might be given various small pipes and asked to assemble them according to blueprint instructions. Or he might be given a sample of the actual work to be done, with pipes of actual size and under actual conditions. An indirect method of discovering the trade skill of an applicant is to ask him various questions concerned with the operations of his trade. The usual objection to this process that there are many men who can *do*, but who cannot tell about it, is not valid, as has been proven by Army experience. The above three types of tests are all concerned with measuring ability which the applicant has acquired. But often it is desired to take men without experience and to train them for the work. In this case, a test of ability to learn the work is needed. Münsterberg attempted to devise such a test by making tasks analogous to the nature of the work to be done. Thus, to test the aptitude of a man to be a motorman, he constructed an apparatus representing a track surrounded by pedestrians, automobiles and the like. If a man could perform the required task rapidly and accurately, Münsterberg considered that he would also be able to learn the work of a motorman rapidly and accurately. Finally, psyschologists to-day are attempting to measure mental processes which enter into various operations, and on the basis of such measurements to predict success or failure. Dr. Link for instance, used, among other tests, what is known as the number group checking test, which consists of columns of number series, similar to the following:

947593
842037
937513

The candidate simply checks each series which contains *both* a "1" and a "7". Link found that this test was a very good one for selecting girls for shell inspection work: those who made high scores in the test became good inspectors; those who made low scores in the test became poor inspectors. In both the test and in the work of shell inspection, careful examination for the presence or absence of definite points is required. That is, the same general mental processes are involved. The number group checking test might not be good for the selection of any other type of worker, but for this one job it meant a saving of thousands of dollars.

Selective tests may be classified in various ways. A common division is that of individual and group, terms which are rather self-explanatory. Practically all group tests can be given individually, but relatively few individual tests can be given to groups without considerable modification. In employment work the ideal method is, of course, to give group tests, but it is not always possible to get applicants together for such a purpose. Some concerns establish a definite period in the morning and another in the afternoon for the examination of applicants. Another classification of selective tests separates those which measure acquired ability from those which measure native ability. The first type is necessary for use with applicants who claim past experience at a particular occupation, such as machinist, or accountant; the second is useful in selecting applicants, especially *young* applicants, for the training division. The differentiation of tests according to native and acquired ability is highly important, and must constantly be kept in mind by the one who devises tests for various purposes. But the person who administers tests is primarily concerned with the division of tests into mental and skill tests, and this division will be used throughout the remainder of the chapter. It is somewhat the same distinction as that between tests for office employees and tests for mechanics.

By mental test is meant one which measures ability to perform tasks which are purely mental in nature, such as memorizing numbers, checking words which are opposite in meaning, or supplying information on various topics. There are three types of mental tests which are useful in the selective process. The first of these is similar in nature to the well known Army test, and will here be called a test of "mental alertness." The accompanying page (Fig. 15) from one of the Army series is typical. If necessary, the directions for this test could be "put over," by simple illustration of the task, to a foreigner who was unable to speak a word of English.

DIRECTIONS—In the test below, each number is represented by a symbol as shown in the very top row.

Thus, “U” stands for 5, and “X” stands for 8. You are to fill in the spaces with the proper symbols. Work as

1	2	3	4	5	6	7	8	9
−	И	⊐	L	U	O	Λ	X	=

1.

3	1	2	1	3	2	1	4	2	3	5	2	9	1	4

2.

6	3	1	5	4	2	7	6	3	8	7	2	9	5	4

3.

6	3	7	2	8	1	9	5	8	4	7	3	6	9	5

4.

1	9	2	8	3	7	4	6	5	9	4	8	5	7	6

5.

9	3	8	6	4	1	5	7	2	6	2	4	8	1	3

6

4	9	5	1	7	5	2	6	9	3	7	8	4	1	8

Figure 15

rapidly and as accurately as you can. WAIT FOR THE WORD "GO."

A candidate who can finish the accompanying test in two minutes is an exceptionally mentally alert person.

A second type of mental test is that which searches for special mental ability essential to success in certain jobs. Everyone has noted the facility which certain acquaintances have for remembering numbers, or names, or for making puns, or for guessing puzzles. These abilities are, in great part, *special* abilities, and should be utilized if possible. It is obvious, for instance, that the telephone operator who has the especial knack of remembering numbers has an advantage over her more forgetful sister. A method of measuring memory for numbers should, then, be useful in weeding out applicants for positions as telephone operators. A very simple test of this nature can be devised by simply asking the candidate to repeat series of numbers after they have been spoken at a rate of one number per second. The task is made increasingly difficult by the addition of another digit each time—the content of each series differs from that of any other series. The number of digits which a successful telephone operator should be able to remember must first be discovered. Then applicants who fail to attain this mark should be rejected. Any individual who can repeat a series of nine numbers, after they have been read to him at the rate of one per second, has a very good memory span for numbers. A different test would have to be used in testing his memory span for faces, or for names.

The third type of mental test is one which measures information, whether general or special. The gauging of the information which an applicant possesses on the work of his field has been proven, beyond doubt, to be one of the best indexes of his ability in that field. The good machinist will be able to name the parts of a lathe, or to state what is missing from a picture, or to name the most popular makes of milling machines. The good personnel executive will know the names of prominent men in the field, will understand current labor trends, will be able to state principles underlying various methods. For example, the Army tested the ability of those who claimed to be accountants by such questions as the followings:

ACCOUNTANT (General)

2:J Q. What is the meaning of (a) B/L, (b) F. O. B., (c) E. and O. E., (d) Pro Forma?
A. (a) Bill of Lading, (b) Free on Board, (c) Errors and Ommission Expected, (d) For the Sake of Form.

3:J Q. On which side of the trial balance would the item "cash discount" allowed to customers appear?
A. On the debit side.

Skill tests, as opposed to mental tests, mean those tests which measure that combination of knowledge and muscular coordination characteristic of the hand mechanic or machine operator. The subdivision of skill tests is quite analogous to the threefold division of mental tests. Comparable with the measurement of general mental alertness is that of general mechanical ability. An ingenious attempt to accomplish this is made by the Stenquist mechanical test, which consists of various dissembled objects, such as a monkey-wrench, a paper-clip, a lock, etc. The candidate is set the task of assembling ten such objects in a half hour.

Paralleling tests of special mental ability are those of special skill or dexterity, other than that acquired by training. The telephone operator needs a close coordination of the muscles of the arm and fingers in order to "plug in" accurately; operators who lack it are responsible for the sharp noise which temporarily injures the ear-drum and the feelings of the subscriber. Mill operatives often need special finger coordination, or "digital dexterity." Skill tests for special ability which approximate in character the work to be performed are comparatively simple to devise and will usually produce good

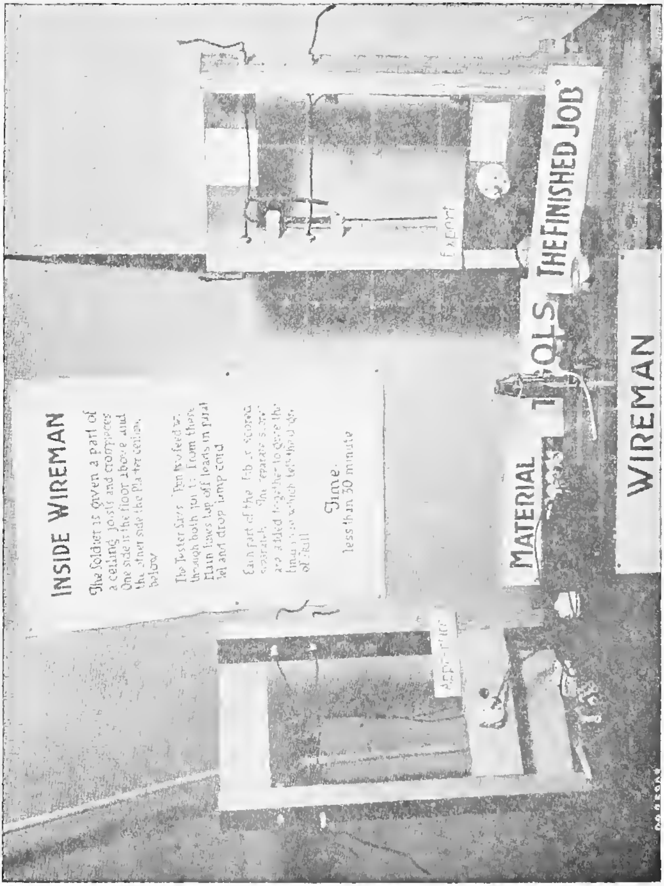
INSIDE WIREMAN
The Soldier is given a part of a ceiling joists and crosspieces One side is the floor above and the other side the Plaster ceiling below
Time
less than 30 minute
Expert
Apprentice
MATERIAL
TOOLS
THE FINISHED JOB
WIREMAN

Figure 16

results. To devise a sample switchboard with several holes, and to note the errors which the candidate makes in learning to plug in, constitutes a relatively simple method of eliminating "hopeless" applicants. Tests for further refinement of successful candidates should, of course, be given.

The third subdivision of skill tests is what is commonly known as the performance test. The candidate is given tools and materials and is asked to perform a certain task according to definite instructions. The resulting product is scored on the basis of the time taken and the accuracy of the work. Performance tests will be considered in more detail later. It is sufficient here to state that they do not always involve elaborate equipment, a fact well illustrated in the accompanying photograph of the Army performance trade tests for inside wireman. (Fig 16.)

In industry the one word "standardization" has meant a saving of millions of dollars. The merchant buys his goods by standardized quantities, the gauge of railroad tracks has been standardized, as have the threads of screws and even the motions of the workers themselves. In similar manner, mental and trade tests, to be of the highest value, must be standardized.

A standardized test has two main characteristics which distinguish it from any other type of examination. In the first place, it must have a purpose. A test is not merely *good*—it must be good for some purpose. One test may be good for selecting machinists, another for telephone operators, still another for accountants. Secondly, any score on any test must have a definite meaning. Twenty-three points may indicate that the applicant is an expert machinist; twenty-two points, that he is a journeyman; eleven points, that he is of apprentice grade only. These two requirements are too often forgotten by those who are using mental and trade tests for selective purposes. Standardization of the test is the procedure by which the purpose of the test and the significance of various scores are established.

The question is, then, how can a test be standardized? In order to meet the first requirement—a definite purpose—it is necessary to check a test for any particular occupation by giving it to those who are already engaged in that kind of work. If known experts, whether they be machinists, telephone operators or accountants, score higher than journeymen (to use the Army classification), and the journeymen score higher than the apprentices, we then have a test which differentiates ability for that kind of work. A very simple method of discovering this is to use what is known as the fourfold table. For purposes of illustration, let us assume that ten machinists have been ranked by their superiors according to their ability as machinists. Workman A is judged to be the best machinist, B, the next best and so on to J, who is the poorest. Each of these workers is given the tentative test, and secures a score as follows:

COMPARISON OF ABILITY AS MACHINIST WITH SCORES IN A TRADE TEST FOR MACHINIST

Workman	Rank as machinist	Score in test
A	1	22
B	2	22
C	3	18
D	4	20
E	5	13
F	6	16
G	7	11
H	8	11
I	9	8
J	10	7

Average score in test: 14.8

We can readily divide the ten workers into two groups: those who are above the average in the test, and those who are below the average. Or we can split them evenly according to the rank given by superiors, and put A, B, C, D, and E into the upper group and F, G, H, I and J into the lower group. On the bases of these two divisions we can construct a fourfold table as follows:

FOURFOLD TABLE

	Below test average	Above test average
Upper half in ability	E	A, B, C, D
Lower half in ability	G, H, I, J	F

The above fourfold table indicates a very good test. For those who made high scores in the test were rated high by their superiors, with the one exception, F. Similarly, those who made low scores in the test were rated low by their superiors with the one exception, E. The chances are, then, four out of five, that an applicant who scores above the average in this particular test will later be rated high in ability. Similarly, applicants who score below the average on this test can safely be rejected, or subjected to further test. It must be remembered that here we have only ten cases on which to base our conclusions. At least twenty-five cases are necessary before a reliable lower limit score can be set—fifty cases would be *more* than twice as good.

There are occasions when the fourfold table will show that those who make low scores in the test will become poor workers, but those who make high scores may become either good or poor workers. In such instances, the test can be used to reject applicants, but further tests are necessary in order to differentiate those who pass the first test successfully.

In the use of the fourfold table, the group is split into two parts only: those who are good or poor; those who are above the average or below the average. If there were fifty or a hundred cases, we might then have broken the group into those who were rated by superiors as excellent, good, average, poor and deficient; and those who scored in the test between 0 and 4, 5 and 9, 10 and 14, 15 and 19, 20 and 24. The last figure represents the total possible numbers of points obtainable in this trade test. Such a classification would enable us to make a table which contains, not four, but twenty-five spaces. The following table typifies the distribution of 100 workers who have been rated by their superiors as indicated, and who have taken the trade test.

DISTRIBUTION OF TRADE TEST SCORES OF 100 WORKERS

Score in Test:

Superior's Rating	0—4	5—9	10—14	15—19	20—24
Excellent				2	8
Good			1	16	3
Average		5	32	3	
Poor	2	15	3		
Deficient	9	1			

The above table has many advantages over the simpler fourfold table. For instance, we can set a minimum test score of ten points for all applicants, because anyone who scores less will in all probability be a poor worker, or average at best. Or we might base the wage scale on the entrance test, and give a certain wage to those who score less than 15, or 20, and a higher wage to those who score 20 or above. A fourfold table shows whether the test answers the purpose for which it is intended, thereby meeting the first requirement of a standardized test. A distribution table such as the above gives fairly definite meaning to the various test scores—the second requirement of a standardized test.

To these two requirements might be added a third which has to do with the test method. The test should be easy to give and to score, so that all examiners will give the test in the same way, and different scorers will arrive at the same total score for any given test record. The psychological examinations of the Army, numbering nearly two million in all, were scored readily by the use of celluloid stencils on which the proper responses were printed. These stencils were laid on the test papers and indicated the correct response to each test question.

Tests of mental alertness should be used only where it is impracticable to devise more specific tests, for the former measure a broad background of ability which the employee may or may not require for the particular task. When mental alertness tests are used, the purpose of the test can be stated as the selection of more intelligent employees for all classes of work. The chances of developing good workers from among a group of intelligent men are greater than from a less intelligent group, and in this fact the mental alertness test justifies itself.

Indeed, the mental alertness test can be made to serve a useful purpose to all parties concerned. The applicant knows that his general ability is recognized, and that to warrant promotion, it is simply up to him to make good at his specific job. The employment division is supplied a basis for the rejection of inferior men, or for better placement. The training division can quickly discover the superior and inferior men and adapt its instruction accordingly. The maintenance division has an index on which to base promotions and transfers. The research division secures data for more and better tests of selection. Finally, the chief executives can uncover men of administrative calibre and can proceed to train them for higher work. To some it may seem that undue opportunity would be presented to the individual who makes a high grade in the mental alertness test. In practice, many of those so selected will prove incapable of performing required tasks, or will lack necessary all around development for a good administrator; on the other hand, many who passed with but low scores will merit immediate recognition for higher positions. That is, the mental alertness test will select superior men in the large majority of cases, but it cannot be used as the *sole index* of a man's ability.

The problem of devising a mental alertness test divides itself into two parts. The nature of the material to be used constitutes the first problem. This should, as far as possible, be interesting to the candidate, and not boresome. To memorize the thrilling story of a fire would be far easier than to memorize a paragraph from a book on logic. Better still, to relate the content of the test to the actual work which the applicant will be called upon to perform if accepted insures an interest that otherwise would be lost. A clerical applicant will be much more interested in a mental test which contains the 'lingo' of the clerk than in one which lacks it. The second problem in the devising of a mental test is the selection of the *form* of the test. There are dozen of different test forms, many of which are impracticable for employment work. If the entire test is composed of a number of separate tests, it is necessary to have an examiner time each test, or else to allow the applicant to finish the entire test and to score him on the basis of the time which he requires to finish the entire examination—the last an unsatisfactory procedure. A recent adaptation of the Army mental alertness test gives the items in cycles, so that when the candidate has completed the first six items he has sampled six different tests. The applicant is allowed twenty-five minutes for the entire test, consisting of 184 items, and his paper is taken up at the expiration of that time. His score then is the number of correct items, minus certain penalties for incorrect items. To make clearer some of the above statements, the following six items, illustrative of six of the tests used in the Army examination blank, are given. The correct responses are here indicated in italics.

Item	Name of the test	General form of the test
1.	Arithmetic Reasoning	How many are 50 tents and 8 tents?.. *(58)*
2.	Opposites Test	beg entreat..*Same* Opposite
3.	Analogies Test	bird-sings: dog-fire, *barks,* snow, flag
4.	General Information	The Merino is a kind of horse, *sheep,* goat, cow
5.	Disarranged Sentence	of Congress laws makes our nation—*True* False
6.	Number Completion	3 7 11 15 19 23 *27* *31*

The above six forms are suggestive of the various ways of presenting test items—there are many others equally useful.

Some practical situations in which mental alertness tests have been found valuable are of interest here. Probably the most spectacular of these is the results brought forth by the Army mental tests. The following list shows the average intelligences of men reporting various occupations when drafted into military service:

Occupational Intelligence

Rank	Name of Occupation	Average Intelligence
1	Engineer officers	Very superior
2	Army chaplains	Very superior
3	Medical officers	Superior
4	Y. M. C. A. Secretaries	Superior
5	Civil engineers	Superior
6	Accountants	Superior
7	Stenographers and typists	Superior
8	Mechanical draftsmen	Superior
9	Dental officers	Superior
10	Bookeepers	High average
11	Army nurses	High average
12	Mechanical engineers	High average
13	General clerks	High average
14	Filing clerks	High average
15	Railroad clerks	High average
16	Telegraphers	High average
17	Band musicians	High average
18	General electricians	High average
19	Photographers	High average
20	Stockkeepers	High average
21	Receivers and shippers	High average
22	Concrete const. foremen	High average
23	Telephone operators	Average
24	Truckmasters	Average
25	Farriers and veterinarians	Average
26	Ship carpenters	Average
27	Stock checkers	Average
28	Auto assemblers	Average
29	Auto engine mechanics	Average
30	Detectives and policemen	Average
31	Toolroom experts	Average
32	General auto repairmen	Average
33	General mechanics	Average
34	Auto chauffeurs	Average
35	Gunsmiths	Average
36	Tool and gauge makers	Average
37	Plumbers	Average
38	Motorcyclists	Average

39	General pipefitters	Average
40	Railroad conductors	Average
41	Telegraph and telephone linemen	Average
42	Brakemen	Average
43	Hand riveters	Average
44	Locomotive firemen	Average
45	General machinists	Average
46	Lathe hands	Average
47	Locomotive enginemen	Average
48	Butchers	Average
49	Marine enginemen	Average
50	General carpenters	Average
51	Heavy truck drivers	Average
52	Bridge carpenters	Average
53	General blacksmiths	Average
54	Painters	Average
55	Horse trainers	Average
56	Bakers	Average
57	Stationary gas enginemen	Average
58	Laundrymen	Average
59	Cooks	Average
60	Bricklayers	Average
61	Caterers	Average
62	Railroad shop mechanics	Average
63	Horseshoers	Average
64	General boilermakers	Average
65	Barbers	Low average
66	Horse hostlers	Low average
67	Concrete workers	Low average
68	Farmers	Low average
69	Mine drill runners	Low average
70	Teamsters	Low average
71	General miners	Low average
72	Cobblers	Low average
73	Tailors	Low average
74	Laborers	Low average

In industry, the mental alertness test has had some interesting applications. By comparing the scores made by its employees with those made by applicants, one concern discovered that it was steadily getting an inferior type of applicant. Opening up of better sources of supply naturally followed this disclosure. Another concern had a mental alertness test given to its eight hundred office employees, and used the results to aid in wage adjustment. Average scores for each kind of job in the company were also secured, as a basis for selecting applicants who were mentally fit for the task to be done. Still another organization discovered that employees who were either far above, or far below, the average mental alertness needed for particular jobs did not remain with the company. Accordingly, an upper limit as well as a lower limit was established. In one company a mental alertness test was found to divide employees-in-training as accurately as could the instructors after they had spent several weeks with the men. It was thus made possible thereafter to divide the entire group initially and to give the proper training from the very beginning. The admirable work done by Dr. Link in the use of various tests for numerous purposes has become a chapter in the advancement of mental testing in industry.

There are many, many occupations in which mental alertness is not the first requisite to success; there are many tasks where the employment director is primarily interested in what the applicant has learned to do, not in what he has the capacity to do. In other words, we often want to test experience rather than native ability. To meet such a need, trade tests have been devised.

Without doubt, the greatest impetus to trade testing was supplied by the development of the Army trade tests, 112 in number, which cover various sub-divisions of over thirty occupations. There were three types of trade tests developed: oral, picture, and performance. The first two of these measure trade information; the last measures the actual product of the workman's hands. It is interesting to note that, out of two hundred and fifty thousand men who professed trade ability, but six per cent were experts, twenty-four per cent were journeymen, forty per cent were apprentices and thirty per cent were inexperienced.

A good trade test must meet four basic requirements. Obviously, it must measure the actual trade ability of the candidate with considerable accuracy. It must, therefore, give uniform results when administered by different (though experienced) examiners, at different times and in different places. Because it is impossible to secure examiners who will know all of the trades tested, the third requirement of a good trade is that it shall be in such form that the examiner himself need not understand the trade. In the beginning of the Army work, this last point was declared to be impossible to obtain. In practice it was found relatively simple to secure by the strict observance of what is called the "keyword principle". The fourth requirement is that the test shall consume the minimum amount of time, energy and material in order to insure the above results.

We have differentiated trade tests into oral, picture, and performance tests. The oral test consists of a series of questions, arranged in order of difficulty, so phrased that the answer can be given in a very few words. The following item from the Army trade test for Painters is typical:

Q. What stain do you get by mixing Van Dyke brown, brown japan, rose lake and rose pink?

A. Mahogany. (Score 4 points)

The above question illustrates the use of the keyword principle, applicable to oral and picture tests alike. The question has been so phrased that the answer can be given in one word. No matter what else the candidate may say, if he mentions "Mahogany", he is given credit; if he fails to mention mahogany, he is scored 0 on that question. It is often quite difficult to phrase the question for a keyword answer, but it can be done in ninety per cent of instances. It is evident that the examiner can score the above question whether he himself knows anything about the trade of painter or not. For certain occupations, trade test questions may be printed on an examination blank, and given to men in the same way as mental tests. For instance, the above question for a painter might very readily appear in the following question form:

If you mix Van Dyke brown, brown japan, rose lake and rose pink together, the resulting stain will be.............in color.

Written tests are not practicable for all trades, because men who are more skilled with gages or drop hammers than with pencils are unduly handicapped.

The picture trade test is greatly similar in nature to the oral. The candidate is shown a picture of a tool or machine. He is asked to describe the object, to name it, to name a missing part, to state the use of a missing part, to point out an error in the picture, or to indicate the order in which various parts would be assembled. Anyone who wishes to devise a trade test can very readily obtain pictures from trade catalogues—he must be careful to observe the keyword principle in phrasing his questions. The accompanying illustrations (Figs. 17 and 18) have been selected from the picture trade test given to Toolmakers in the Army. The questions used were as follows:

Picture 14

Q. What do you call that tool?

A. Internal (male) thread gage. (Score 4 points)

Picture 16

Q. What kind of reamer is that?

A. Shell. (Score 4 points)

Performance trade tests are most easily sold to employers, but in practice they are no more accurate than the oral or picture tests. For the candidate may be given *one* task to do with which he happens to be quite familiar—if he does that task well it is assumed that he can do all tasks in the trade well. Again, the costliness of administering performance tests and the difficulty of scoring them throw the balance in favor of the use of oral tests wherever possible. But there are some few tasks in which it is absolutely essential that the actual, productive skill of the worker be tested. No employer would allow an applicant to drive a five-ton truck simply because he had answered certain question correctly, or had known the names of various truck parts. The chances are that such an applicant would be well able to drive the truck, but a demonstration would be somewhat more convincing.

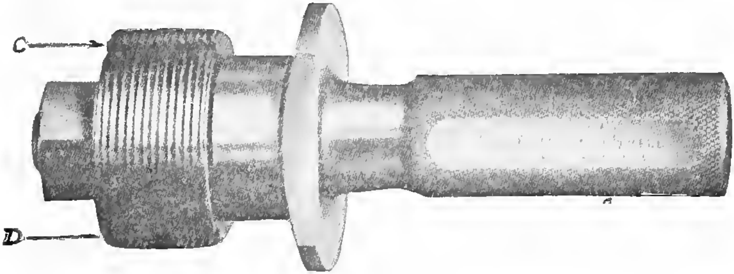

Figure 17

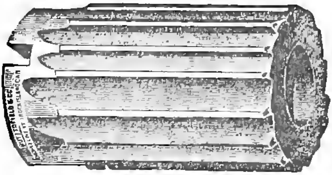

Figure 18

Performance tests can often be made to act as checks for the findings of oral and picture tests, if the examiner has any doubt at all as to the actual skill of the applicant.

The findings from standardized trade tests are valuable to the individual who is tested, to the personnel department, and to the chief executive of the organization. The applicant or employee finds himself compared with other men in his own trade, and is often made to realize his own deficiencies. Many a journeyman honestly believes that he is an absolute expert at his trade. The employment division can substitute knowledge of the applicant's ability for the usual judgment based on his years of experience and training. The training division is supplied with a means of measuring the results of its instruction. Often trade tests can be made the basis for promotion and transfers, thereby simplifying the problem of the maintenance division. The research division is afforded bases for better selective tests, for measures of production, and for a more complete use of the personnel specification, i. e., a check of the material secured against the specifications for that material is made possible. Finally, the chief executive can arrive at a rough estimate of the number of skilled workers in the company. When the employment division reports that by the use of trade tests, this number has been materially increased, the chief executive can modify his production plans accordingly.

The value of trade tests is no longer questioned. Many concerns have devised trade tests without any attempt to utilize the keyword principle, to score the answers, or to find out those answers which characterize the expert, the journeyman, and the apprentice. Even so, results have justified their use. Still other companies have adopted bodily the Army trade tests, with somewhat better results. The latter should, however, be changed to meet the conditions in each organization. To devise and standardize entirely new trade tests is a rather costly procedure—each Army trade test cost about one thousand dollars to bring to its final form. No trade test should be used in selection which has not been previously given to known experts, known journeymen and known apprentices in the trade.

The oral trade test is the most popular form, because it is relatively simple to give and to score. In devising the oral trade test, the investigator must first obtain numerous questions on the work of the trade. Some of these ought to be relatively simple, some fairly difficult, and some very difficult. These questions should next be phrased so that the proper answers can be indicated by keywords. Questions which can be answered by either yes or no should be avoided, as well as questions which have but two possible responses, for the candidate has an even chance of getting the correct one by pure guesswork.

When a list of questions has been carefully compiled, the investigator should give them to men of known trade ability, and note, in stenographic form, the replies of each worker. A simple method of tabulating responses is as follows:

CORRECT RESPONSES OF FIFTEEN TRADESMEN

	Expert Workers					Average Workers					Inexperienced Novices				
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Question 1	*		*	*	*		*		*						
Question 2	*	*		*		*		*		*		*	*		*
Question 3	*	*	*	*	*	*	*	*		*	*				

*—correct

In the above table, questions 1 and 3 are acceptable whereas 2 is not. Question 1 cannot be answered by novices, and not all average workers can get it right. Question 3 again picks out the novices. Question 2 has no differentiating value at all, for as many novices as experts answered it correctly—it should, therefore, be omitted or revised.

On the basis of the findings from workers of known skill, the test items should be arranged in order of difficulty, and a numerical score assigned to each question. The Army method was to allow four points for each correct response, two points for each half correct response. If the examiner could not decide whether to give two or four points, he gave three points; indecision between two points and none at all resulted in one point. This method is superior to merely scoring the candidate either right or wrong, as must be done if only one point is allowed for each item. Cutting points, or critical scores, should be established for each trade skill classification, so that the applicant can be rated as an expert, a journeyman, an apprentice or a novice. The exact location along the scale of the three cutting points must be determined by the results obtained from the workers of known skill.

The following instructions to trade test examiners have been taken from the Personnel Manual of the U. S. Army:

INSTRUCTIONS FOR GIVING ORAL TRADE TESTS

1. Ask each man all the questions in the order given.
2. Be very careful to make yourself heard distinctly.
3. Do not change the questions.
4. Do not prompt the candidate in any way.
5. Do not illustrate any terms with gestures.
6. Give no indication of the quality of the candidate's answers.

7. Give special emphasis to underscored words.
8. Guard against giving any clue to the answer through emphasis on any particular word unless it is underscored.
9. A question should be repeated:
    (a) When no answer is given.
    (b) When the candidate says, "I don't understand the question," or the equivalent.
    (c) Whenever the answer cannot be scored and repetition seems the appropriate procedure.
10. An answer which is unequivocally wrong should be scored without repetition or follow-up questions.
11. Whenever an answer cannot be scored on the basis of what the candidate says, the examiner should use one of the following questions·
    (a) Anything more?
    (b) Any other name for it?
    (c) Any other way of saying the same thing?
    (d) Any other way of doing it?
12. An answer which includes the correct answer but with additional statements is to be given full credit *except* when any part plainly negates the correct answer.
13. When the question calls for a name and the candidate answers in terms of a description, the examiner should say: "The question calls for a name, not a description. What is your answer?"
14. Do not permit the candidate to talk endlessly after he has made his answer. Give him the next question.

There are many dangers attendant upon the use of mental and skill tests. In most instances, one cannot be substituted for the other, although one may supplement the other, as is the case when performance trade tests are used to check the results of oral information tests. The applicant should not be accepted or rejected on the basis of his test score alone, for there usually are many other qualities which make for success or failure in the job. The error of basing conclusions on too few cases is one of the most common. But by far the greatest menace to the success of tests of selection is the type of examiner who is often allowed to devise and to administer them. None but skilled research men should be permitted to devise tests, and none but a trained examiner should be authorized to give them. The practice of having half-baked tests devised and administered by petty clerks fully deserves the wholesale failure which attends. It is far better to use the accepted tests of experienced investigators. If selective tests are worth anything at all, they surely warrant the salary of an experienced examiner who will be able to bring out their real value.

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CHAPTER VIII

METHODS OF RATING ABILITY

There are many jobs in which it is impossible to measure production. Records could scarcely show the results of a worker who is doing repair work. In many other jobs there is no definite production. The information clerk produces something which cannot be measured, except as it affects those to whom the information has been given. The repairman produces incomparable quantities of work; the production of the information clerk is primarily qualitative. In such instances as these, the rating scale becomes highly valuable.

Even in those jobs where production can be definitely measured, records do not tell the whole story. A man might be a skilled producer, have a record of perfect attendance and years of faithful service, and yet not qualify for a position as foreman. A sales engineer who primarily sells *service* to customers might pass mental and skill tests with high grades and still lack the necessary social intelligence to make him a success. The rating scale provides a means of measuring qualities which cannot otherwise be gauged.

It is human nature to make blanket judgments of everyone with whom we come in contact. The rating scale analyzes the blanket judgment into its most important parts, and forces the one doing the rating to realize that the individual rated may be very high in certain qualities and very low in others. Perhaps the foreman has taken a strong dislike to a particular worker because of his shrill voice. Or perhaps the reverse is true, and he rather likes a certain jovial worker. The analysis which the rating scale causes the foreman to make, may show him that the worker he dislikes is a high producer, has considerable initiative, and is quite loyal, whereas the jovial worker may be a bluffer through and through.

We may divide all types of judgment into either qualitative or quantitative. The applicant is either accepted or rejected; he is honest or dishonest; he is experienced or inexperienced. These are examples of qualitative judgment. Or a business man may express his opinion of the applicant by judging him to be a 90 per cent man. Somewhat more specific than this statement would be the judgment that the applicant is 90 per cent industrious, but this estimate is still very far from a concrete expression which means the same thing to the one who hears it as to the one who says it. On a par with the last two statements is that which classes the individual above or below average. Here, no one knows definitely what the average is. A step beyond the preceding methods of judgment is that in which the man is rated A, B, C, D, or E on a number of concrete qualities. Another way of expressing about the same type of judgment is to classify the individual into the quarter, or the fifth, of the group to which he belongs. To say that an applicant for a position as machinist would probably become as skilled a producer as those in the upper quarter of machinists now employed would mean much the same thing to all who were well acquainted with present employees. A numerical score as the expression of rating becomes quite definite if we know the average score of the group and the total possible number of points. A further refinement of this method is to express results in *percentiles*. By this scheme is expressed the percentage of the entire group which is exceeded in ability by the person who has been rated. Thus, a 90 percentile machinist would be one who had ability in excess of 90 per cent of all machinists under consideration. The percentile method is most valuable when large groups are under consideration. If there were but five machinists in the group, the best one of these would have a percentile rank between 80 and 100; if there were fifty in the group the best one would have a percentile rank of either 99 or 100; if there were one hundred in the group, the best one would, of course, have a percentile rank of 100.

For purposes of industrial personnel, interviewers' ratings should be differentiated from superiors' ratings. It is obvious that the interviewer cannot judge an unknown applicant so thoroughly nor on so many qualities as can the superior who has had opportunity to observe the worker for months or years.

The value of any rating system depends upon the ease with which the rating can be made and the usefulness of the result when obtained. The ease with which the rating can be made is an important factor in selling the idea to future rators, and in instructing them in the proper use of the rating scale. The time which the rator must devote to the rating of his subordinates must always be taken into consideration. The usefulness of the rating result depends primarily upon the familiarity of the rator with the individual rated. But other factors may enter in. If the rator does not judge conscientiously, or if he lacks knowledge of the nature of the work performed by his subordinate, his results will not be so accurate as otherwise. One simple way of increasing the accuracy of ratings is to secure ratings of the individual worker from more than one superior, and to combine these into a final judgment.

There are numerous types of rating systems. One of the simplest of these is to check qualities which the "ratee" does or does not possess. The classification given by Dean Schneider of the University of Cincinnati is typical. He includes such pairs of qualities as "roving—settled", "outdoor—indoor", and "mental—manual". This method is purely qualitative and does not express results in a convenient index, such as by points, per centages, or by percentiles. Still other grading systems require the rator arbitrarily to assign points or percents to certain listed qualities, such as honesty, loyalty, ambition, etc. The letter grade system of rating has already been mentioned. This method is quite simple and necessitates very little instruction. The following table shows how it can be used in practice:

RATING BY USE OF LETTER GRADES

A-Very Superior B-Good C-Average D-Poor E-Very Inferior

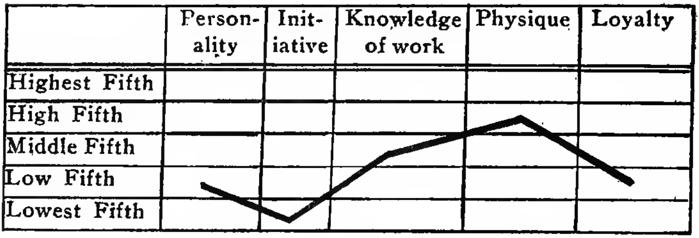
Name of Employee	Payroll Title	Personality	Industry	Knowledge of work	Physique	Loyalty
Owen, B. M.	Ledger clerk	A	A	B	A	B
Hoyt, L. J.	Ledger clerk	C	C	B	B	C
Dunn, C. K.	Bill clerk	A	A	A	D	A
Weise, A.	Counter clerk	B	D	E	C	E
Emrock, R.	Office Boy	D	E	C	B	D

To express results of the above scheme in a total index it is necessary to assign numerical grades to each letter grade. Thus A might be given five points, C, three points, and E, one point, etc. The total score of the first man then would be 23 points. Final translation of grades into points as here indicated is superior to the initial assignment of numbers to each quality, because many rators would have no objection to grading a man "E" in physique, but would balk, perhaps, at giving him one point only. In connection with the Army rating scale, an officer had been instructed to assign 15 points for highest physique and 3 points for lowest. Later, when he came to use the scale he exclaimed: "It's impossible. There can't be anyone with a physique of only three!"

The method or ranking each member of a group is a simple and effective one. To say that an individual stands thirteenth out of a group of fifteen indicates, with considerable reliability, his status in relation to the other members of that group. If it is desired to combine rankings, the numbers of the ranks can be added together to form an index. Here it is to be noted that the best man will have the smallest index.

The method of classifying a worker into a fifth of the total group has already been suggested. It is possible to arrange the recording sheet in such manner that the traits of any individual may be charted. Thus, the following chart represents graphically the ratings given in the previous table to R. Emrock:

GRAPHIC RATINGS[1]



The executive will quickly become familiar with the various types of worker represented by different kinds of curves. Sooner or later he will discover the shape of curves which stand for the best workers in various jobs.

There is another type of graphic rating scale which in practice has proven quite effective. Horizontal lines of uniform length are assigned for the rating of each quality. The extreme left end of the line signifies a total lack of that quality; the mid-point of the line its presence in average degree; the extreme right end of the line its presence in highest degree. Thus, the following checked line might indicate the rating given to R. Emrock in the one quality of "Industry":

---

[1] The author is indebted to Dr. B. V. Moore, Fellow in Personnel Research, Carnegie Institute of Technology, for valuable suggestions on the graphic rating method here shown.

LINE RATING

Lazy ✓	Inactive	Ordinary	Hard worker	Very industrious

In the above presentation, it is not essential that five terms be used—four or six might better express the varying degrees of the quality under consideration.

A rating scale in which all the items would be capable of definite measurement would practically amount to a test and would naturally be highly useful. Such a scale must necessarily omit such points as loyalty, aggressiveness and the like, and assume that records of attendance and production, or school marks and salary, measure practically the same qualities. The following content has been suggested in part by Mr. Kendall Weisiger, Personnel Manager of the Southern Bell Telephone Company. Although no exact method of weighting these measurable items has been devised, they are presented for further development and improvement.

ITEM IN A QUANTITATIVE RATING SCALE

1. Physical standing.
2. Schooling.
3. Mental alertness.
4. General information.
5. Information of business or job.
6. Trade skill.

7. Years experience.
8. Attendance.
9. Production.
10. Accidents through carelessness.

Finally, there remains the Scott rating system which was used so extensively and so successfuly in the Army. This system will be considered in some detail, inasmuch as it has been perfected far beyond the other schemes mentioned.[1]

The introductory explanation of the Army rating scale, used for the instruction of officers in rating procedure, provides a concise statement of the value of the rating scale:

> The rating scale is a practical system by means of which an officer's capacity and fitness for promotion can be gauged quickly, accurately and with uniformity and justice.
>
> The rating itself is a numerical expression of the degree in which an officer possesses the military qualifications deemed most essential.
>
> The degree to which he meets these qualifications is determined by comparison with officers of the next higher rank. Every officer is measured in terms of the actual ability and performance of other officers.
>
> Where instructions are followed closely the results show a high degree of accuracy and uniformity. The total average ratings of widely separated camps have shown a variation of less than one point in a hundred. The rating scale is a constant and reliable gauge of an officer's merit.
>
> No system has yet been devised which so completely eliminates the personal equation or so justly determines merit. Because the Rating Scale calls attention separately to each of the several essential qualifications for an officer, it lessens the danger that judgments may be based on minor defects, with a corresponding disregard of important virtues.
>
> It takes approximately twenty minutes to create a working scale and sixty seconds to make a rating.

Accompanying is a rating scale for a personnel manager. The names inserted represent personnel managers who possess the various qualities to the degree indicated. The rating scale becomes a master rating scale when names are inserted in the spaces, as shown in the illustration. Thus the one who made out this particular master rating scale considered that, of all the personnel executives with whom he was acquainted, Robb stood highest

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[1] The author is indebted to Dr. Scott for many valuable points concerning the use of the Scott rating scale.

Master Rating Scale
for Personnel Manager

I Appearance and Manner

Consider how well he will impress employees, foremen and department heads. Is he a good mixer?

Highest	*Robb*	20
High	*Bertolet*	16
Middle	*Anderson*	12
Low	*Alspach*	8
Lowest	*Jennings*	4

II Personal Qualities

Consider his attitude toward inferiors; his willingness to shoulder responsibility; dependability in keeping his word; ability to judge impartially; candidness in analyzing conditions.

Highest	*Bertolet*	10
High	*Anderson*	8
Middle	*Trueman*	6
Low	*Jennings*	4
Lowest	*La Rue*	2

III Progressiveness

Highest	*Bertolet*	10
High	*Anderson*	8
Middle	*La Rue*	6
Low	*Alspach*	4
Lowest	*Jennings*	2

IV Executive Ability

Consider his ability to secure cooperation, stimulate interest, impart information; to handle difficulties tactfully; to organize work for subordinates; to secure results.

Highest	*Robb*	15
High	*Trueman*	12
Middle	*Jennings*	9
Low	*La Rue*	6
Lowest	*Barker*	3

V Knowledge of Personnel Work

Consider his previous experience in personnel; in allied fields. How extensively has he read in personnel, efficiency, management, economics and psychology?

Highest	*Pickwell*	10
High	*Robb*	8
Middle	*Alspach*	6
Low	*La Rue*	4
Lowest	*Barker*	2

in Appearance and Manner, Jennings stood lowest, and Anderson was about average. But in considering the heading "Knowledge of Personnel Work", Robb was placed as half way between the highest and middle examples of that particular quality.

The rating scale has had an interesting development. Dr. Scott, in his attempt to select salesmen scienticallly, quickly realized the unreliability of general impressions or judgments, even when rendered by the keenest of interviewers. He found for instance in comparing the judgments of various sales managers on thirty-six applicants that one applicant was ranked third by one judge and thirtieth by another; a second applicant was ranked first by one judge and tied for thirty-second place by an equally competent interviewer. There was, of course, general agreement among all judges but numerous striking discrepancies indicated the absolute need for an accurate rating method. This need Dr. Scott attempted to fill by devising a rating scale for salesmen.

When the war broke out it was imperative that officer timber be found quickly. The rating scale was so successful in selecting men for officers' training camps that it was later used for the rating of all officers. Instead of the stagnating method of promotions based on seniority, the rating scale was utilized to permit the most rapid advancement of those who were the most deserving. In the Army work, each officer was compared with other officers of immediate superior rank. It is probable, however, that industrial workers should be compared with their fellow workers and not with superiors, unless the rating is to be used definitely for promotion. Rating of foremen has already secured a firm footing in personnel practice, and is being extended to apprentices in training, to minor executives and in some instances, to the entire working force.

The rating scale in industry can benefit the ratee, the rator and the personnel manager. The individual who is rated realizes that demonstrated ability is to be recognized, and that a record of it is to be kept constantly before those who have charge of promotions. He furthermore learns what particular qualities are considered desirable, so that he has a basis for the development of those qualities. The chief benefits of the rating scale are, of course, to the one making the rating. The interviewer is aided in initial selection; the executive is forced to analyze his subordinates in a way that he has never done before. By a careful recording of the rating results, the executive can check his ratings with later accomplishment, and is thereby provided with a check on his estimates which enables him to make better future judgments. The chief executive of the organization, or the personnel manager, is supplied with data on which to balance the various departments of the business. Exceptionally strong and weak men are discovered; the strong and weak points of each man are revealed. The rating scale makes possible a charting of the growth of each worker from year to year. A valuable by-product of rating by superiors is the indication of the type of subordinate preferred by each executive. Such realization facilitates the transfer of a good man from a superior who, for one reason or another, does not approve of him.

The devising of a rating scale is not such a difficult task as might at first appear. The problem falls logically under the supervision of the director of personnel research. He should first secure from future rators a list of items which they believe are most essential to success in the particular job for which the scale is being constructed. In this way he will usually secure a rather lengthy list from which he must eliminate items so that the qualities retained will be most important for success in the job, will have the same meaning to those who must use the scale, and will not overlap in significance. By such a process of elimination the research director should be able to cut down his list to a dozen items or less. These should then be grouped under a few main headings as has been done in the rating scale for personnel executive previously shown. The relative importance of each main heading must next be determined. To secure a consensus of opinion on this subject from those who are competent to judge is undoubtedly the best method to arrive at these relative weights, but in practice is usually quite difficult to obtain. It is preferable that the total possible number of points should not equal 100. When relative weights have been obtained, numerical values should be assigned to each main heading. These values should be readily divisible into five parts, such as 20, 16, 12, 8, 4, or 15, 12, 9, 6, 3, etc.

The devising of a rating scale is not without its pitfalls. One of the most alluring of these is the inclusion of too many qualities. Rators cannot be expected to pass careful judgment on dozens of items. The use of generalized terms is another error to be strictly avoided, or, if they seem unavoidable, they must be carefully explained. The grouping of possibly conflicting terms under main headings invariably produces confusion. For instance, under the main heading of "Character", one rating scale lists "ambition" and "freedom from gambling". If the person rated were both ambitious and indulged in gambling, the rator would be placed in a quandary. Another source of error is the inclusion of qualities which are not related to success. A rating scale for a machinist need not include the item of "general information." Finally, as has already been pointed out, the same items cannot be used for rating of applicants as are used for the rating of employees.

When the rating scale is ready for use, it is the problem of the rator to transform this scale into a *master* rating scale by the insertion of names of men of his acquaintance who exhibit the desired qualities. In the master rating scale for a personnel manager, it has been necessary for the general manager who filled in the names to select from all personnel executives of his acquaintance that one who was highest in appearance and manner, that one who was lowest, that one who stood about half-way between these two extremes and, finally, those who stood about half-way between the highest and the middle, and the lowest and the middle. He followed the same procedure for each of the remaining four headings. The resulting master scale represents a fairly permanent human measuring rod against which all possibilities for the position of personnel manager can be compared. Referring back to the scale, we note that an applicant who compared favorably with Bertolet in "Appearance and Manner" would receive 16 points. If, in the opinion of the rator, the applicant exceeded Bertolet in this quality but was not on a par with Robb, he might then receive 17, 18 or 19 points.

In the selection of names to be used in the master rating scale, there are four principles which should be observed. The original list of names from which the selection is made should be as large as possible, in order that extremes may be obtained. One main heading of the scale should be considered at a time, for it is obvious that although Robb is high in "Appearance and Manners" he need not be highest in "Knowledge of Personnel Work." Indeed, he might have been lowest. Each name selected should exhibit clearly the desired quality. Finally the steps between names should be about equal. That is, as far as practicable, Robb should exceed Bertolet in "Appearance and Manner" by as much as Bertolet exceeds Anderson.

The master rating scale can, of course, be used time after time. The rator is familiar with the persons whose names appear on his master scale, and he should familiarize himself with the directions for using the scale. When he has done this, he should be able to rate any individual within a very few minutes. He must consider each main heading at a time, and make a *man to man comparison* of the one rated with the actual men whose names appear on his master scale. When he is rating a group, it is better that he rate each member of the group on a single quality than to complete the rating of each member before he undertakes that of the next. Similarly, in rating a group, the rator should not add the totals until he has rated each individual on all qualities. The total rating for any ratee equals, of course, the sum of the points assigned to each main heading. Above all the rator should avoid a preconception in terms of points of the person being rated. All judgments should be recorded, as bases for revision of the rating scale, and for checking up the accuracy of the rator's judgment.

There are various difficulties in the use of the rating scale which should be realized. A lack of acquaintanceship with the man rated will invariably handicap the rator, and therefore make the total rating less valid. However, there are instances, such as the rating by the employment interviewer, when this difficulty cannot be avoided. Many rators make the false assumption that an individual high in certain qualities will be high in all qualities, or that those holding positions commanding large salaries must necessarily be rated high. Neither of these is necessarily true. The rator must furthermore overcome a tendency to be generous. He should seldom, if ever, change a rating total to make it conform to his blanket judgment. The possible future development of an individual worker should not be confused with his present performance, although it might well be considered in a rating for promotion. The greatest difficulty in the use of the rating scale is to get rators to follow instructions accurately. This is primarily a problem which demands that the research director or personnel manager *sell* the significance and importance of the raing scale individually to each rator.

Each division of the personnel department shares in the benefits of an adequate rating system. The employment division is concerned mainly with interviewers' ratings, so will usually take advantage of their findings. The training division can utilize initial interviewers' ratings as well as a scale for apprentices-in-training. The maintenance division takes advantage of the results of periodic ratings in effecting transfers and in recommending promotions. Particularly is this true for office employees performing work with no measurable production. All ratings are grist for the mill of the research director as bases for the formation of selective tests and for confirmation of the findings of those tests.

In conclusion, it must be remembered that success in various jobs will depend upon many different factors. The rating scale used for one kind of work will not do at all for some other kind. It is true, however, that there are usually many elements in common. The differing elements which contrast one job with another must be discovered, and rating scales devised accordingly. When carefully devised and administered, a rating system becomes a highly valuable asset for the work of the personnel department.

Ratings which are carefully made, and never used, are worthless.

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Chapter IX

EDUCATION AND TRAINING

"For centuries men have been damned and fired, and hired and damned and fired again." In this phraseology one writer indicates the necessity of training men for the work which they are to perform. A careful study will convince the most conservative of the value of training workers for their jobs. In general, low production may be due to one or more of the following causes:

1. Failure of the management to supply proper tools, power, equipment, materials, or working conditions.
2. Lack of knowledge of the worker concerning the work to be done, or deliberate soldiering on his part.

It is evident that the perfect provision of many essential factors might readily be damaged, or even negated entirely, by the presence of one or more deterrent factors. That is, management may have supplied the proper equipment and working conditions and the employee may be quite anxious to do his part, yet production might still be very low because the worker lacks the necessary knowledge. Training work is not an absolute guarantee of increased production, but it does make it possible. Two hundred manufacturers who installed training divisions testified that output had been increased thereby—a good omen for other manufacturers.

Practice has shown that not only is production increased through the services of a training division, but wasted material and spoiled product are lessened. Furthermore, because machine operators are more familiar with the machines which they operate and therefore have less fear, accidents are usually decreased. Particularly is this true in training new, inexperienced men. Whether new employee or old, training broadens the worker's knowledge of his trade and his ability in that trade. The fact that a man has had years of experience in a certain operation is no guarantee that he is performing that operation in the best possible way. Instances are often found where new employees who have just completed the apprentice course become larger producers than the very best of the old employees. Due to greater precision in methods of work, increase in quantity of output is often, although not always, accompanied by an improvement in the quality of the product.

The effect of training on labor turnover is usually quite marked. The two hundred manufacturers previously mentioned who testified that training work had meant increased production for them also stated that their labor turnover had been cut in half. Let the reader accept the figure of fifty dollars per man as the cost of turnover and calculate roughly the saving if the turnover of his company were to be cut in half. One manufacturer stated that turnover among operatives to whom training had been given was but 12 per cent yearly, whereas among those without training it was 180 per cent.

Training, in some form or other, is unavoidable. The old way is to allow the worker to pick up the work by costly trial and error. No one knows when the worker becomes really competent to handle all phases of his trade. No one is responsible that he does become proficient. No care is taken that the begininer gets his information and his practice from a worker who is himself really competent. If the foreman is forced to break in the newcomer, he must constantly shift back and forth between executive duties and instructional duties. Production is interrupted, for the time of skilled workers is taken up by the new employee. The new method of training follows out the principle of specialization. Someone is definitely responsible for the instruction of the worker, and for his ultimate proficiency. The apprentice derives the benefit of instruction from a specialist. The wheels of production continue smoothly until the new cog is prepared to fit into the mechanism.

A comprehensive training program includes office, shop and sales force. The education essential for these three groups usually differs widely, although there may be considerably overlapping. Office training deals primarily with stenographic work, correspondence, filing, computing machine operations, bookkeeping and various forms of personal service. Sales training is concerned with the principles of salesmanship, organization policies, the selling points of the commodity, analysis of territory, records and contract procedure. Shop training has three aspects. It may be desirable to increase the worker's knowledge of his work, or his skill in that work, or his general level of education. Americanization work typifies well the last of these three objectives. Inasmuch as space does not permit of an exhaustive treatment of the different training methods required for office, sales and shop, the latter only will be considered in this chapter.

In undertaking the training of shop employees, the training division must recognize two distinct tasks. One of these is the training of new men for various positions in the shop; the other is the upgrading of old employees who are retarding production. The latter is the more difficult problem, because workers must unlearn old habits. But that splendid results can actually be accomplished by upgrading is indicated by the accompanying typical chart (Fig 19), which is the daily record of a workman

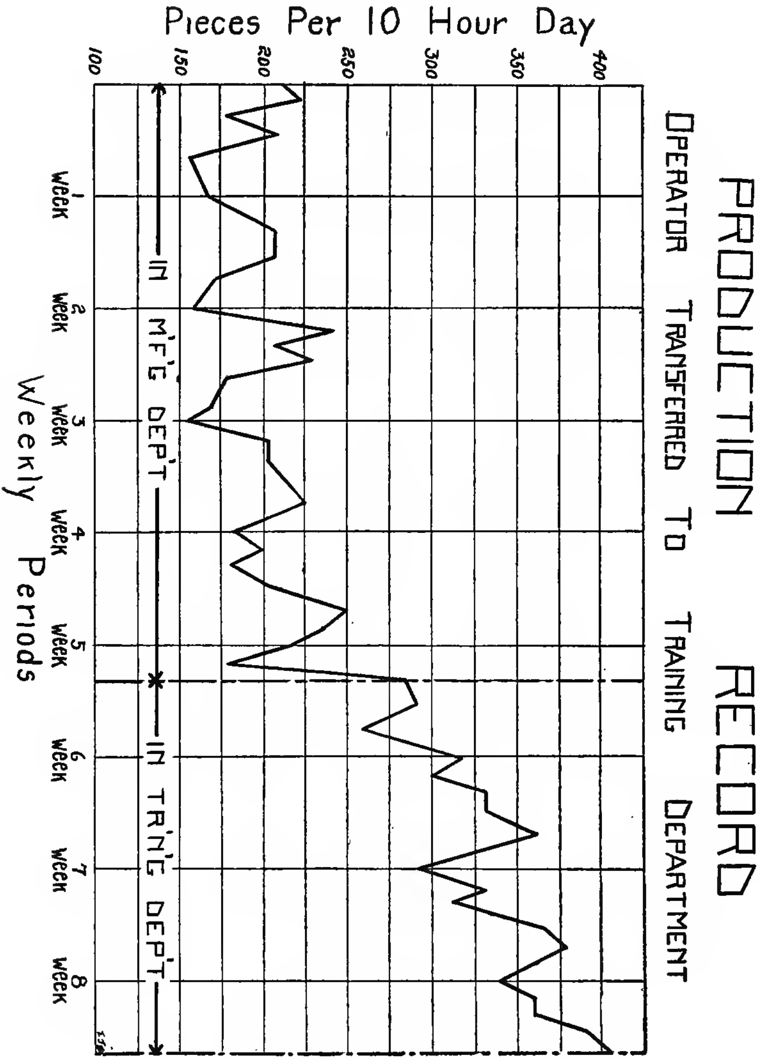

Figure 19

in a New England factory before and after transfer to the training department.[1]

There are various methods of training the new worker. The old apprenticeship system is still in vogue in many industries, although its popularity is on the wane. Gilbreth's three-position plan, whereby each employee is being trained for the next higher position and is in turn training a subordinate for his position, constitutes an ingenious training method. Taylor recognized the need for specializing the instruction of the worker when he created a special foreman for that purpose. The training division of the present is but the logical growth of past tendencies.

At the present time there is considerable controversy as to whether training in classes, or the "vestibule school," is superior to training on the job. In class instruction, the learner passes through a graded series of exercises arranged in order of difficulty. His product is not useful—the material he uses may either be used over and over again, or else scrapped. His skill is acquired before he attempts actual performance, thereby saving considerable spoilage. Constant supervision is unnecessary, for his work is of no value. On the other hand, the vestibule school method requires a period of non-productivity, involves extra equipment and uses up valuable space. The learner is working under artificial conditions which, coupled with the fact that his product is junked, cause him to have less interest in his work. One of the largest manufacturers of electrical parts in our country secured strong interest from apprentices by actually *buying* from them the acceptable units of product. When training on the job can be given, it is considered by many to be preferable. The product stands, thereby securing greater interest from the new worker. The training conditions are decidedly real, and there is no entirely non-productive period. There is, of course, the danger of excessive spoiled work. Furthermore, it is generally impossible to arrange jobs in order of difficulty, or in a sequence that insures varied experience for the learner. Conditions of work will usually decide whether the vestibule school, or training on the job, should be used.

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[1] Used by courtesy of the U. S. Department of Labor, Washington, D. C.

The vestibule school possesses all the advantages of preliminary planning and careful organization. Work can be taught in *blocks,* a practically impossible task where training-on-the-job is given. Allen defines a block as "a group of jobs which all offer to the learner the same *kind* of difficulties." Thus, all the operations pertaining to a milling machine would constitute one block of the machinist's trade, and can be taught with little or no reference to planers, shapers, lathes or bench work. Again, in nearly all concerns there is a common core of knowledge which every worker should possess. Included in this core are such items as plant policies and customs, records, routine of work, safety precautions and the like. The best way to insure that each new worker receives this information in full, and does not merely pick up bits of it from time to time, is to teach it in conjunction with the trade work of the vestibule school.

There are other educational agencies of slightly dissimilar nature. Some companies hold factory classes for the raising of the general level of intelligence. Trade information, health lectures, current topics, or 'pep' talks, are considered in these classes. Other companies take advantage of the part-time classes conducted under the city school systems, paid for out of the educational pocketbook. Continuation classes for those who have not yet reached legal working age fall under this same category. Several large companies have made close contact with nearby colleges, so that their men can attend these colleges and apply the benefits of the education so received for the good of the industrial organization.

Foreman training is certainly one of the most highly specialized phases of factory training. Foremen courses are of two distinct types. The first aims to supply the foreman with definite information concerning the tools, materials and methods of his particular shop. The second type aims rather to give him an understanding of the problems of management and of the principles of handling men. Courses which have stressed the management aspect while including some specific content have, in most instances, proven quite valuable.

A most successful training feature has been what is commonly known as the flying squadron. This squadron consists of a number of men who are trained in practically all jobs in the plant. When work 'jams' at any particular place, the squadron is put at that place to relieve the pressure. In essence, it amounts to a method of correcting routing errors and of facilitating rush orders. One of the prime reasons for the success of flying squadrons is the fact that men consider it an honor to be selected for it, because membership indicates that they are all-around experts.

Americanization work in industry has attracted considerable attention, and justly so. The New York State Industrial Commission estimates that one half of the accidents in factories, with a resultant loss of $50,000 per day to industries, can be ascribed to ignorance of the language. Statistics of the Department of Labor for a period of eight years show that the rate of accidents in the iron and steel industry was highest among non-English speaking workers. The Ford Motor Company reported a decrease in accidents of 54% since beginning educational classes.

The experiences of others have already established a fairly definite order of procedure in instituting Americanization work. That its ultimate success or failure depends upon the selection of the right man to direct it is obvious. His first duty is to sell his work to management and to foremen. The latter are his direct agents in the various shops, and must not only be passively acquiescent, but must be made actively interested in carrying out the Americanization program. Racial leaders for the several groups must next be discovered, and the whole idea explained to them in some detail. A good method of enlisting their interest is to have them carry out a census of the number of men of each nationality and of the educational background of each worker. On the basis of this information, and of the shop needs as expressed by the foremen, the Americanization leader can make up a course of study and select his teachers. He should keep in mind two aims in formulating the course of study. Primarily he is attempting to supply workers wth the fundamental language tools which will enable them better to understand and to carry out instructions, and to read safety signs around the shop. A secondary aim, from the industrial viewpoint, is the inculcation of American ideals and customs, leading usually to citizenship. In selecting teachers for Americanization classes, it is quite as essential to secure men or women who have a thorough sympathy with the foreign born as it is to employ experts in the art of pedagory.

Attendance at classes presents a difficult problem, not only in Americanization classes, but in all training groups. Here the support of the foremen can be made to count most strongly. Records reveal that an attendance of 90 per cent can be secured if the foreman is an enthusiastic supporter of the work, whereas this figure will drop to from 50 to 70 per cent if the foreman is indifferent. Constant stimulation of the racial leaders will tend to keep the attendance figures high in the Americanization classes. Naturally, the teacher is the biggest single factor in upholding attendance—if his teaching interests the men, they will attend. If not—

There are many indirect educational agencies which fall under the scope of the training division. Many concerns successfully operate a plant library in conjunction with a reading room. Books in such a library may usually be classed under the following heads: fiction, inspirational, health and hygiene, management, and technical. Some organizations establish a central distributing point for the exchange of clippings, magazines or books within the company. The maintenance director will usually do well to ascertain the type of book which ambitious young men are requesting from the company librarian. If the employer does not care to risk the financial investment necessitated by the purchase of many books, arrangements can usually be made with a nearby public library for the loan of a number of books to be kept in the plant, and for the requisitioning of other books in the usual manner.

The training division should take an active part in the compilation and distribution of booklets and bulletins of an educational nature. Illustrated lectures are usually well attended, even when held on the employee's time. The training division can exercise a judicious guidance in the selection of outside night or correspondence courses and can stand ready to assist the individual in the various problems that will invariably arise in connection with such courses.

The plant paper is one of the most important connecting links between management and the worker. A well balanced plant paper will contain at least four sections: service, information, instruction and entertainment. If a qualified individual can be discovered, it is far better to select the editor of the plant paper from the ranks of the employees than to bring in an outsider. To test the esteem in which the paper was held by the workers, one company offered to give binders to all employees who could produce copies for a whole year—and had to put in an extra order for binders above the number which had been estimated.

It is not essential that the director of the training division himself be experienced in all the trades taught, although such experience would undoubtedly be of value. It is important however, that the actual *instructors* be those who have "been through the mill"—apprentices will have more respect for them than for graduates of technical schools and the like. It is also important that instructors be well toward the prime of life, rather than young men under thirty. Accompanying is a suggested personnel specification for the director of training—it would, of course, need to be adapted, by many additions or modifications, to the needs of any particular organization.

PERSONNEL SPECIFICATION

PAYROLL TITLE Educational Director Symbol Ed
IMMEDIATE SUPERIOR Personnel Manager
NUMBER OF SUBORDINATES 6
DESCRIPTION OF JOB DUTIES

Directs the work of the training division, which includes office, sales and shop training. Has entire charge of all men in training. Makes trade analyses and devises courses of study. Criticises the teaching methods of the instructors under him. Supervises the publication of the plant paper, formulates educational bulletins, and gives lectures. Is responsible for the company library. Coordinates the training division with other divisions of the personnel department.

NATURE AND CONDITIONS OF WORK

Executive office work. May be classroom or shop if does any teaching.

MAN REQUIREMENTS

Age. Above thirty years.

Physical. Average office type of physique, capable of prolonged intensive work occasionally; adaptable to both office and plant conditions.

Intelligence. Superior. "A" or "B".

Education. Graduate of a technical high school or college preferred. Should understand the principles of pedagogy, the organization of commerce and industry, the processes of the business, the problems of management, the psychology of handling men. Knowledge of editorial work desirable.

Temperament. Directive, analytic.

Social Qualities. Sympathetic, encouraging, good personality.

Experience. Industrial education; shop, office or sales practice; administrative work; editorial work; other phases of personnel; teacher; social work.

One of the first duties of the training director is a survey of all occupations within the plant, followed by a trade analysis. The preliminary survey should take account of the number and importance of the various trades in the concern, of the principal causes of labor turnover, of the evident inefficiencies due to workers' ignorance, of spoilage and wastage, of nearby agencies for education and training, of the number of foreign-born, of the value of present teaching methods, of the system of promotion and finally of the general attitude of foremen and workers. On the basis of such a survey the trade analyses can be undertaken.

Analyzing a trade amounts to little else than listing every element that enters into a thorough knowledge of that trade. The Cass Technical High School of Detroit has made a detailed analysis of the machinist's trade. The following analysis for Engine Lathe work is but a small portion of the larger outline put out by this school.

MACHINIST REQUIREMENTS FOR ENGINE LATHE WORK

MACHINE OPERATION

Care of centers; turning on centers; turning on mandrel; chuck and face-plate work; facing; drilling; boring; reaming; thread cutting; taper turning; knurling; filing; polishing.

KNOWLEDGE OF MACHINE AND ATTACHMENTS

Name, care, and use of the principal parts of machine; carriage, apron, crossfeed, compound rest, bed, ways, head stock, tail stock, back gears, change gears, spindle, lead screw, splineshaft, various kinds of chucks; independent, universal, combination, collets or draw-in, and special; face-plates; steady rest, follower rest; use of change gears, lead screw, carriage, and cross feed index; taper attachments; compound rest; tail stock adjustments; backing-off or relieving attachment.

TOOLS USED ON MACHINE

Wrenches, dogs, clamps; names, care, and use of the tool-post of tools; solid tools, Armstrong tools; care, to include tempering, grinding, and oil stoning; face plate mountings; bolts, clamps, parallel strips; angle plates, etc; drills, and drill grinding for various metals; shell and solid reamers; drill sockets; drift, etc; tool-post set of tools for thread cutting; taps; dies; knurling tools; files.

MACHINIST'S TOOLS

Steel rule; square; hammer; center punch; scratch awl; dividers; calipers, inside and outside; micrometers, inside and outside; center gauge; hermaphrodite calipers; combination set; protractor; surface gauge; center indicator; depth gauge; vernier caliper; bar caliper; wiggler; drill gauge; center gauge for shaping thread tools; thread gauge; thread micrometers.

GENERAL SHOP KNOWLEDGE

Time cards; tool checking; general rules for safety and sanitation; belts; pulleys; lubricants, to include oils, greases, and cutting compounds; counter shafts; line shafts; cone and geared-head machines; motor drives; fits and finishes; cutting speeds; gear combinations; general knowledge of thread systems; standard V and square threads; special threads: double, triple, etc; standard tapers; names and uses of standard files; polishing materials; use of hand-books, catalogs, reference books.

MATHEMATICS

Common fractions; decimals; proportion; simple percentage; simple equations; use of formulae; measurement of angles; measurement of areas and volumes; square root; making and reading of graphs; solution of right-angled triangles; relation of radii, diameters, and circumferences of circles; mathematics of; cutting speeds, pulley ratios, feed gear ratios, back gear ratios, taper computations, thread computations, thread measurements, change gears for thread cutting, gear blank sizes; mechanics as applied to: force, motion, levers, pulleys, wheel and axle, etc; general laws of work, energy, power.

DRAWING

Reading of drawings to the extent of ordering stock, making layout for job, and comprehending mechanical requirements; how to make drawings for ordinary machine parts.

The formulation of courses of study naturally follows the trade analysis. Such courses should take into consideration, not the content of the trade as a whole, but only those parts with which the organization is concerned. If, for instance, there are no shapers in the machine shop, it would obviously be unnecessary to teach such work. The determination of blocks is an important problem. A block has previously been defined as a "group of jobs which all offer to the learner the same *kind* of difficulties." Where there are several blocks in a trade, as is the case in the machinist's trade, it should be possible to teach all the necessary elements of that block without touching upon other blocks in the trade. For example, a worker could be taught to operate a milling machine without mention of a planer or shaper. The same principle can readily be applied to office training. A ledger clerk could be trained for his duties without understanding the work of the stenographer, of the cost accountant or even of the bill clerk who perhaps supplies him with material for entry. Admittedly, allied knowledge is an asset in any kind of work, but it could hardly be demanded of the training division—the cutting point of supervised training must be established somewhere.

The final step of the trade analysis is the determination of common elements. To illustrate, the outline previously cited lists the following as knowledge common to the various phases or blocks, of the machinist's trade:

KNOWLEDGE COMMON TO ALL PHASES OF MACHINIST'S TRADE

COMMON SHOP MATERIALS

Cast iron; wrought iron; malleable iron; machinery steel; cold rolled steel; tool steel; high speed steel; brass; copper; babbitt metal; solder.

COMMON SHOP SUPPLIES

Washers; bolts; nuts; machine screws; cap screws; set screws; etc.

NAMES AND USES OF COMMON SHOP TOOLS

Wrenches; clamps; dogs; arbors; chisels; hack saws; files; scrapers; parallel strips; V blocks; angle plates; taps and tap wrenches; dies and die holders; hand reamers; hand drill; breast drill; drills, and drill grinding for various metals; shells and solid reamers; drill sockets; drift; etc.

MACHINIST'S TOOLS

Steel rule; square; hammer; center punch; scratch awl; dividers; screw drivers; calipers, inside and outside; micrometers, inside and outside; center gauge; hermaphrodite calipers; combination set; protractor; surface gauge; trammels; depth gauge; vernier caliper; bar caliper; drill gauge; thread gauge; thread micrometers.

GENERAL SHOP KNOWLEDGE

Time cards; tool checking; general rules for safety and sanitation; belts; pulleys; lubricants, to include oils, greases, and cutting compounds; counter shafts; line shafts; cone and geared-head machines; motor drives; fits and finishes; cutting speeds; gear combinations; general knowledge of thread systems; standard V and square threads; special threads; double, triple, etc.; standard tapers; names and uses of standard files; polishing materials; use of handbooks, catalogs, reference books.

MATHEMATICS

Common fractions; decimals; proportion; simple percentage; simple equations; use of formulae; measurement of angles; measurements of areas and volumes; square root; making and reading of graphs; solution of right-angled triangles; geometry of circle; mathematics of pulley ratios, feed gear ratios, back gear ratios, taper computations, thread computations, thread measurements, change gears for thread cutting; mechanics as applied to: force, motion, levers, pulleys, wheel and axle, etc.; general laws of work, energy, power.

DRAWING

Reading of drawings to the extent of ordering stock, making layout for job, and comprehending mechanical requirements. How to make drawings for ordinary machine parts.

The selection of instructors is an important factor, and one which may make or mar the training work. The teacher with actual shop experience knows many tricks of the trade which will not be found in books. He furthermore realizes the relative values of the time element in various practices. He can create a shop atmosphere, and apprentices will readily imitate him because they respect his experience. He understands and sympathizes with the viewpoint of labor. On the other hand, the teacher who has had a theoretical training, perhaps in a technical school, will probably understand the principles of teaching, will realize the problems of scientific management and will therefore have the viewponit of management. Because his education has been of a broader nature, he can more readily grasp the import of problems outside of his own field, nor is he likely to overemphasize any one trade, as the mechanic might do. However, all things considered, the practical instructor generally is preferable to the theoretical, if he is at all possible from the teaching standpoint.

There are two ways of measuring the value of instruction: the subjective, and the objective. Under the first, the educational director observes the instructors and rates them according to a predetermined rating scheme. This method is particularly valuable where the nature of the training is such that there is no definitely measurable product during the training period. The training of salesmen affords a good example. The objective method, on the other hand, is concerned with noting the improvement in the learner during the course of training, as indicated by the amount of work which he is capable of turning out. The training of pieceworkers usually permits measurement of the instruction by objective means. The upgrading chart shown in a previous section of this chapter illustrates the desirable upward trend of productivity resulting from a few weeks in the training division.

A personnel specialist of national fame recently reported an interesting instance of successful training which was discontinued because of the opposition which the success evoked. A three weeks training course in foundry practice was installed, under the supervision of a technically trained instructor who had also had practical experience. So successful was the attempt that in the short period of three weeks new men were made as competent as older men who had picked up their foundry practice during four to six years of experience. Impossible as this may sound, the expert responsible for the statement asserts that he has absolute proof of its validity. But opposition from workers and foremen alike proved so strong that the training work was discontinued temporarily to avert trouble. The voyage of the training director is not always characterized by smooth sailing.

The employer is naturally interested in the cost of training work. The Department of Labor has reported the results on this item from over two hundred manufacturing concerns. The expense of training was found to vary from $8 to $100 per student, with an average at about $20. In most companies the value of the learner's product exceeded the cost of giving him instruction. Indeed, because of decreased turnover, spoilage and accidents, and increased production, the conclusion is reached that training work is highly profitable. Training work that did not in the long run give even a slight return to the employer could hardly be considered wise industrial practice. As it is, both employer and employee share in its results—a proper condition.

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CHAPTER X

HEALTH SUPERVISION

Modern industrial leaders have come to realize that the prosperity of industry as a whole depends in greater part upon the physical efficiency of workers and upon their continued service than upon either purchasing, sales, or production. The worker who continually struggles against ill health, and the worker who is scrapped after relatively few years of productive service, alike represent losses to industry and to society. In 1910, it was estimated that there occurred among workers over thirteen million cases of illness, involving an annual loss of nearly three-fourths of a billion dollars. A large part of such annual loss is preventable.

From the narrow viewpoint of tangible profits, health supervision can be shown to pay. Compensation insurance rates are smaller for concerns which have well organized safety features. Considerable compensation to injured imployees is prevented. Absenteeism and turnover are decreased; production is increased. Statements like these are not theory—they have been substantiated in hundreds of concerns.

In this chapter, we shall regard health supervision in its broadest aspect. Medical treatment in its various phases will be considered. Dental work, one of the most recent additions to the health division, will receive due attention. The field of the sanitary engineer, of the illuminating engineer, of the safety engineer will all be touched upon. Since the mutual benefit association is concerned primarily with matters of health, it logically belongs to the work of the health division. The significance of what is being termed "industrial hygiene" will be noted. Finally, health propaganda for the prevention of illness and accidents will briefly be reviewed.

In most plants where these several activities are carried on, it has not yet been realized that they all have a common aim, and should therefore be centralized under one capable director. The safety section jealously guards its secrets, and considers itself separate and distinct from the sanitation section, or the medical section. Whether in a consolidation of these divisions the safety engineer, the sanitary engineer, or the physician shall be put in charge is immaterial—the important thing is the realization of the advantages of centralizing health activities, so that the activities of all may be coordinated.

The work of the medical section of the health division can readily be broken up into three main parts. The physical examination of incoming employees has been mentioned in a previous chapter. The value of this work will be here considered in more detail. The second part consists of the periodic physical exmination of all employees. Under the third part is included special attention necessitated by accidents and incidental ailments.

The benefits of a physical examination of all prospective employees has become evident. The employment division is given a basis for the placement of an applicant in work for which he is physically fitted. The familiar case of the applicant who does not even know he has a partial hernia, and who has applied for work which involves heavy lifting, supplies a concrete instance. If nothing else were accomplished by the entrance examination than the exclusion of applicants with undersirable defects and contagious diseases, the employer would be well rewarded for his investment.

The experience of a department store in Dayton is illuminating.[1] This store found that it had to reject about five per cent of all applicants for the following reasons, arranged in order of frequency:

1. Venereal diseases.
2. Tubercular trouble.
3. Contagious skin trouble.
4. Contagious eye disease.
5. Physical unfitness.

An added discovery makes the preceding findings of even greater value: "One of the startling facts . . . . is that our records show that the majority of applicants infected with venereal disease have been those applying for positions in our kitchens, soda dispensing, and market departments!"

But a proper entrance examination does not aim to benefit the employer alone. The worker participates as well. For he is prevented from being put on work for which he is physically unfit, and at which he would not only fail, but would also injure himself further. Often he learns of defects whose presence he may never have suspected, and which often may be cured without much difficulty. Consciously or unconsciously he realizes that his own health is being safeguarded, as well as that of his family, particularly against contagious diseases. In a Chicago industry employing 15,000 people, 44 cases of contagious skin diseases were discovered within a period of six months. A great loss to employer and employee from epidemics was thus prevented. The entrance examination furthermore serves the purpose of an informal introduction to the company physician, thereby paving the way for the worker to utilize the physician's services whenever needed. The wise company doctor will sell his work to the applicant during the entrance examination, for he may never have another opportunity to talk with the worker personally.

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[1] The Need for and Value of Physical Examinations of Employees, by F. H. Rike, Annals of the American Academy of Political and Social Science, Philadelphia, May, 1916.

Some further figures from the department store quoted above may be interesting. This organization found that twenty-five per cent of applicants suffered from minor defects which did not prevent employment. As far as possible, these defects were followed up to see that the worker had carried out the recommendations of the physician. The following list indicates the most important minor defects, ranked in order of frequency:

1. Defective teeth.
2. Nose and throat trouble.
3. Defective vision.
4. Flat foot.
5. Varicose veins,
6. Slight hernia.

The benefits of the periodic physical examination parallel those of the entrance examination. The employer is assured of a working force which approaches physical fitness; carefully kept records will enable him, in a few years, to make comparison of the physical condition of his force with that of previous years. Contagious diseases can be discovered and wiped out before they devastate the attendance record. The employee is given the advantage of expert advice, incipient ailments can be rooted out before they become acute or chronic. The examining physician is given an opportunity to learn whether his previous recommendations have been carried out, and to make further suggestions. He also discovers what defects are permissible in various jobs, something which he would never derive from the entrance examination. Opposition to the undertaking of periodic physical examinations is usually rather feeble, particularly if entrance examinations have been in vogue. After a very few months the practice is accepted by all parties concerned as proper routine procedure.

The work of the physician which is included under the term "special attention," is quite miscellaneous in character. Accidents require first aid treatment—this should be administered by anyone who is competent if the physician is not immediately at hand. A dispensary is necessary in large plants to take care of the numerous minor injuries and ailments. Large establishments usually equip a hospital for patients, or provide beds in a neighboring hospital. In most states Workmens' Compensation Acts require that the employer shall supply medical services and hospital treatment for stated periods after an accident.

The first aid kit is practically indispensable in every company. The following excerpt from a bulletin on Industrial Accidents and Their Prevention, issued by the Federal Board for Vocational Education, indicates the requirements of the usual first-aid kit.

"The first-aid kit for the employee or the small group of employees who work at isolated points should be small and compact. It should provide everything necessary for actual first aid that the layman can use. It is desirable that such employees be taught elementary first aid, using the Red Cross methods or some other methods approved by the company physician. In addition, each kit should be accompained by a very simple, preferably illustrated, instruction book. The contents of a simple but complete first-aid kit, which may be contained in a metal box approximately 7 by 10 by 4 inches, include the following:

1. Instruction book.
2. Six ampules (vaporoles) containing 3½ per cent iodine (small size).

3. Box of toothpicks.
4. Two one-half-ounce packages absorbent cotton.
5. Two 1-yards cartons sterile gauze.
6. Ten-yard spool one-half-inch adhesive tape.
7. Pair of scissors (3-inch blade).
8. Two rolls of 1-inch and one roll each of 2 and 3 inch bandages (10-yards).
9. Three triangular bandages.
10. Three-ounce collapsible tube of sterile petrolatum (or similar ointment) for use in treatment of burns."

The employer is naturally interested in the cost of medical work, as related to what it saves. The following figures on this subject have been taken from an article in The Journal of Industrial Hygiene, September, 1919. The quoted sections are, however, from the Monthly Labor Review for October, 1919.

APPLICANTS EXAMINED AND APPLICANTS REJECTED BY THE MEDICAL STAFFS OF TEN INDUSTRIES

Item	Number	Per Cent
Total number having no disabilities of any moment	66,309	55.6
Total number employed having disabilities that did not interfere with selected work	41,158	34.7
Total number rejected for work because of disabilities	11,433	9.7
Total number of applicants examined in 1 year	118,900	100

Total number of regular employees in the 10 industries 102,400

"In commenting on these figures, Dr. Mock states that it is fair to assume that these 11,433 applicants who were rejected for work would soon have lost their positions because of inefficiency, or would have left because of sickness; certainly by the end of the year practically all of these would have been eliminated from the working force."

The author next shows what saving has been effected by the physical examination. Using the low figure of thirty-five dollars per man as the cost of labor turnover, he calculates the saving resulting from the rejection of the 11,433 men as over four hundred thousand dollars. "Dr. Mock believes that it is fair and conservative to estimate that at least 10 per cent of those applicants with physical disabilities who were employed would have left very shortly if they had not been placed on jobs suitable for their physical condition. . . . This, it is figured would add . . . $144,000 to the profit of the employers from this system."

Against the $544,000 savings must be balanced the cost of the medical work in the ten companies. Using the figure of $2.50 per employee, arrived at in another investigation, the author computes that the cost of medical work in the ten concerns was approximately $256,000. This total subtracted from the saving of $544,000 gives a resultant saving to the employers of $288,000, a sum well worth saving.

Considerable stir has been created in the medical world by the discovery of the relation between ill health and diseased teeth. The significance of such a discovery has not yet dawned upon most industries. The value of dental work closely parallels the now undoubted value of medical supervision—both contribute to the chain of health-efficiency-production. The Metropolitan Life Insurance Company has recently made it compulsory that every employee undergo dental examination at least twice a year.

The National Cash Register Company of Dayton, Ohio, has a fully equipped dental dispensary—visits are purely voluntary on the part of employees. It is significant however that there is constantly a waiting list of approximately one hundred names. The opening paragraph of a booklet entitled "Good Teeth—Good Health" sounds the keynote of justification for dental work in industry.

> The mouth is the gateway to the body. Through this gateway all food, which is taken into the body as nourishment, must pass. You would raise your hands in horror at the thought of eating poisoned food, yet thousands are doing this very thing every day. How? By mixing their food with decayed material and pus from teeth that are rotting away. It poisons the food and poisons the body. Dr. Osler, the world famous surgeon, says this causes more physical harm than alcohol.

In some concerns it has been found necessary to require periodic optical examinations, particularly in industries which involve intricate eyework, or where work is done under strong glare. In such organizations the illuminating engineer, whether permanently attached to the company or brought in as consultant, is usually of great service. The U. S. Shipping Board, Emergency Fleet Corporation, set the following specification for illuminating as follows:

Specification 250-1

SAFETY SPECIFICATIONS FOR ILLUMINATION

The desirable artificial illumination to be provided and the minimum which will be permitted at the work, on the plane of the working surface, are given in the following table:

Foot-Candles

		Desirable	Practice	Minimum
(1)	Roadways and yard thoroughfares	0.05	0.25	0.02
(2)	Storage spaces	0.25	1.00	0.25
(3)	Stairways, elevators, elevator landings, passage-ways, aisles	0.75	2.00	0.25
(4)	Toilet and Change rooms	2.00	4.00	0.50
(5)	Foundry	2.00	4.00	1.25
(6)	Rough manufacturing, such as rough machining, rough assembling, rough bench work	2.00	4.00	1.25
(7)	Rough manufacturing, involving closer discrimination of details	3.00	6.00	2.00
(8)	Fine manufacturing, such as fine lathe work, pattern and tool making, light colored fabrics	4.00	8.00	3.00
(9)	Special cases of fine work, such as engraving, drafting, dark colored fabrics	10.00	15.00	5.00
(10)	Office work, such as bookkeeping, typewriting, etc.	4.00	8.00	3.00

NOTE: The foot-candle, the common unit of illumination, is the lighting effect produced upon an object by a standard candle at a distance of one foot. At two feet, the effect would be not one-half foot-candle, but one-fourth foot-candle, etc. A lamp which would give 16 candlepower uniformly in all directions would produce an illumination of one foot-candle at a distance of four feet in any direction. Measurements of illumination are to be made at the work with a properly standardized portable photo-meter or illuminometer.

The whole question of sanitation is exceedingly difficult, and decidedly important. War has long since been declared on the common drinking cup, yet it persists. Even the so-called sanitary drinking fountains have been questioned, for it has been shown that in most types germs can be transmitted from one person to another. The accompanying illustration, (Fig. 20) used by courtesy of the U. S. Department of Labor, shows the type of fountain that has been approved as "absolutely sanitary." The supply value is operated by a foot pedal, which makes it unnecessary for hands to touch any part of the fountain and which enables a workman carrying a heavy load to secure a drink without first depositing his load.

The heating and ventilating systems may play important parts in the efficiency of the working force. Various investigators have shown the relation between physical energy and such items as heat, fresh air and humidity.[1] Finally, sanitation work calls for careful supervision of all toilet facilities, for proper sewage disposal, for riddance of vermin and for the careful selection and inspection of all food. Measures such as the above are not only right from a decent human standpoint, but they are profitable from the standpoint of a wise investment.

The accident section of the health division is usually a most important one, although its importance will necessarily vary with the nature of the business. For practical purposes, accidents must be divided into avoidable and unavoidable, although the attempt should be made to change the latter into the former. The actual work of the accident section includes the analysis of conditions, the installation and inspection of mechanical safeguards and finally the proper education of workers along lines of safety.

The analysis of accident conditions is a research prob-

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[1] See Hollingworth & Poffenberger. Applied Psychology.

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lem and should come under the scope of the research division, although worked out in close cooperation with the safety engineer. The findings should be turned over to the accident section with various recommendations. It is necessary to discover the number of accidents in each kind of job, the percentage which these numbers represent, the relative seriousness of various kinds of accidents and the costs resulting. An analysis of this nature will readily indicate the weak spots which should be attacked first by the accident section.

Mechanical safeguards will usually cut down the number of accidents by one-quarter, without further effort. But a statement of this nature implies that three-quarters of all accidents can only be prevented by proper education of the worker, thereby revealing the really big task for the accident section. It is not sufficient that mechanical safeguards be installed and then left to perform their expected miracle. Careful inspection is necessary to see that the actual safeguards are kept in proper repair, to see that workers are using them, and to see that they do perform what was expected of them.

The value of safety specifications cannot be overemphasized. These force an analysis of conditions that otherwise might be neglected. They record much information that would otherwise be retained in the minds of several men, and lost if those men were to leave the company. Safety specifications, moreover, prevent much argument and afford a medium through which the orders of the safety engineer can be carried out in detail.

The safety committee, composed entirely of workmen, has proven very satifactory in most plants. The members of this committee are usually appointed by the foreman or superintendent, and serve for terms of three months or more. The short term enables many workers to participlate, and so to feel some responsibility for safety work. The committee makes periodic tours of inspection and reports its findings and recommendations to the foreman or safety engineer. Some concerns have had badges made for the committee members, so that they might more readily be recognized by other workmen and to place some added honor on membership. A well organized safety committee can readily be made the starting point for the establishment of various types of shop representation, if such is contemplated.

Safety education has been shown to be the biggest task of the safety section. In this it must work hand in hand with the division of training and education. Americanization work should stress the safety aspect of all work, for it has been demonstrated that a considerable proportion of accidents is due to inability to speak and read English. The plant paper becomes a very good medium for putting across various ideas on safety. An interesting account of a well known employee who was saved the loss of an eye because he wore goggles, coupled with a picture of the broken goggles, will make a lasting impression on all those who read it.

Bulletin boards for safety posters and the like have come into favor, and justly so. The essential feature about the material which is placed on these boards is that it shall be strong enough to attract attention, and shall convey its main idea in a very few words, or by illustration. One company exhibited forty-two broken goggles, with the caption, "Forty-two Eyes Saved in Ten Months."

Safety Rules in one form or another are used by numerous concerns. In some instances these are placed in the pay envelopes; in others they are sent to individual workmen on official company stationery. In one plant, safety rules were placed from time to time in odd corners about the workmen's benches, particularly in places which had been shown to involve danger. Safety Rule Books are believed by some managers to help the cause of prevention greatly, especially if some means is taken to make sure that the books are read and understood. In some instances, the safety specifications are placed in these rule books in conjunction with instructions to foremen and workers.

So far we have mentioned accident education work as pertaining to the workman. But the foreman and superintendent must be thoroughly sold in order to get the best results. If the foreman does not insist that the various mechanical safeguards be used, they will be worth little. It is rather easy for a foreman to dominate a safety committee, without the knowledge of the safety engineer. On the other hand, if the foreman is thoroughly convinced of the value of safety work, he will urge the committee to increased activity with correspondingly good return.

That safety work pays has long since been proven. In five years of safety work at the U. S. Steel Corporation, the original investment in safeguards, wages, etc., was saved plus one hundred per cent extra. Fifteen thousand employees were saved from death or serious injury during the period from 1907 to 1915 inclusive. This prevention of human waste meant an incidental saving to the company of about a million dollars in *turnover alone*. Compensation, medical attention, lost time and production which would have been entailed if these fifteen thousand accidents had occurred would undoubtedly have cost the company several millions additional. It is no wonder that this corporation is one of the most advanced in safety practice.

Other concerns have secured results comparable with the above. Following is a list of a few companies where organized safety work caused some remarkable reductions in accidents.

PERCENTAGE OF ACCIDENT REDUCTION FOLLOWING ORGANIZED SAFETY WORK

Name of company	Percentage reduction
Cadillac Motor Company	69
Commonwealth Edison Company	40
Eastman Kodak Company	78
Fairbanks Morse Manufacturing Co.	72
International Harvester Company	88
Jones and Laughlin Steel Company	78
Packard Motor Car Company	72
The Pullman Company	46
U. S. Steel Corporation	41

Careful records should be kept of all accidents. In most states this is compulsory under the provisions of Workmen's Compensation Laws, thirty-seven states having such laws in effect. When accident records are analyzed, the number and severity of accidents should be noted according to kind of work, department or gang, sex, age, intelligence level, season of the year, day of the week and hour of the day, etc. Accompanying is a report form used by the Emergency Fleet Corporation which gives a concise summary of many pertinent facts. (Fig. 21).

It is particularly important to note the frequency of accidents each hour of the day. In chapter XV, page— given, there is shown a chart which shows how accidents increase as the morning wears on, decrease over the noon rest period and then steadily increase once more up to the end of the afternoon. This condition is due in great part to accumulated fatigue.

It has only been within the last decade that scientific findings on fatigue have been applied to industry. Fatigue has been shown to be the result of poisons which are created in the body from muscular activity. Rest permits the blood to remove this fatigue, so that the

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Name and location of company.

ACCIDENT AND SAFETY STATISTICAL REPORT.

Month of...19....

Shop department or occupation.	Injuries.										Average number of employees per day for the month.	Total number of production hours.	Number of 250-hour workers.	Lost-time injuries per 1,000 250-hour workers (frequency)	Days lost as result of lost-time injuries.	Days lost per 1,000 250-hour workers (severity.)	Lost-time injuries per 1,000 employed.	All other injuries per 1,000 employed.	Yearly rate based on months.		Shop department or occupation.
	A	B	C	D	E	F	G	Total lost time.	All other.	Total.									Frequency.	Severity.	
Total																					

Key:
A Beyond day of injury but not over 7 days.
B Over 7 days to 14 days.
C Over 14 days to 28 days.
D Over 28 days.
E Permanent partial disability.
F Permanent total disability.
G Fatal.

Time covered.	Accident expenditures.						Safety expenditures.			
	Company hospital or emergency rooms.	Public hospital.	Surgical (outside doctors).	Compensation.	Miscellaneous, clerical, legal, etc.	Total.	New work.	Renewals and repairs.	Maintenance safety organization.	Total.
Current month										
This year to date										

—A well-arranged form for presenting accident data to the executive, and for a permanent record.

Figure 21

activity may be repeated. But the significant feature for industry is the fact that continued activity causes fatigue to accumulate more and more rapidly. Five minutes of work will result in so much fatigue; an added five minutes of work will cause perhaps twice as much fatigue as was caused in the first five minutes. But two minutes rest at the end of the first five minutes may be sufficient for the removal of practically all the fatigue which resulted, depending upon the heaviness of the work. Then the second five minutes of work will give the same amount as was present after the first five minutes. Another two minutes rest, and the muscles are once more ready for *full vigor activity.* Taylor realized this principle in his classic example of Schmidt at the Bethlehem Steel Company, who was enabled to carry 47½ tons of pig iron per day as contrasted with the former 12½ tons. In a similar instance the record of driving 600 rivets per day was raised to 1600 by alternating 1¾ minutes of work with 2 minutes of rest.

The entire health division is concerned with the education of workers to a proper standard of physical efficiency. The results of accident propaganda can more readily be observed than those from a dental campaign, which fact often causes a neglect of education work along lines of medical and sanitary care. Man is born with an instinct of repulsion for those things which are decidedly detrimental to his health, as evidenced, for instance, in the rapidity with which he will get rid of the half of a worm when he sees the remaining half lying in the apple which he is eating. Undoubtedly the reader feels repugnance at the very thought. This instinct should be appealed to if real action is desired. Pamphlets, lectures, moving pictures and visiting nurses are but a few of the mediums which can be utilized in health propaganda work.

An entirely different angle of the health division is shown in the work of the mutual benefit association. Accident insurance, sickness insurance, death benefits and pensions are usually included under the scope of these associations, with occasionally other features such as savings, stock buying and the like. We shall here consider the first four only, inasmuch as these only are directly related to the work of a health division.

Accident insurance has been brought about in great part by the Workmen's Compensation Laws. Employers may either carry their own insurance, or they may pay premiums to regular insurance companies. Many employers feel that they can not only comply with the legal requirements in case of accident but they can well afford to go beyond these. There is a danger, however, if the employer pays full wages during the absence of the employee, that malingering will be encouraged.

Over ninety percent of the mutual benefit associations throughout the country have sickness benefits. When we realize that among thirty-three million industrial workers there are thirteen million cases of illness yearly, the value of sickness benefits becomes evident.

Under the various Compensation Laws, benefits for deaths resulting from accidents are made compulsory. In most associations, definite insurance is carried so that death benefits may be paid no matter what the cause of death. Large insurance companies will insure groups of workers under the group insurance plan, whereby a stipulated sum is paid to the family of any worker, regardless of the length of service, sex, or other conditioning factor. Of the various industries, each represented by 10,000 members or more, the death rates per 1,000 are as follows:

ANNUAL DEATH RATES IN VARIOUS INDUSTRIES

Industry	Death Rate per 1,000
Iron and steel rolling mills	6.7
Machinery manufacturers	6.5
Coal mining	5.6
Street railways	8.8
Wholesale and retail stores	5.5

Industrial pensioning is an acknowledgement of the debt which industry owes to the worker for his services during the productive portion of his life. Many believe that industrial pensions constitute but a step toward government pensions. Regardless of the underlying trends involved, it is certain that, more and more, large organizations are adopting pension systems as part of the work of the mutual benefit association.

The following table outlines very briefly the pension plans of four large organizations of national repute.

SOME REPRESENTATIVE PENSION PLANS

Name of Co.	Pension Age	Years Service	Annual Pension
Commonwealth Edison Company	Class I:55 II:60 III:65	Class I:30 II:15 III:15	For each year of service, 1½% of average annual pay during consecutive 5 yrs. when average pay was highest.
American Telephone & Telegraph Co.	Males, 60 or 65 Fem., 55 or 60	Males, 20 or 25 Fem., 15 or 20	For each year of service, 1% of average annual pay for preceding 10 yrs.
Sante Fe Railway Co.	65	15	For each year service, 1¼% highest pay during any consecutive 10 yrs. up to $50 mo., and ¾% of any excess of such av. mo. pay over $50.
New York Central Railroad Co.	70 any	10 over 20	For each year of service 1% of average annual pay for 10 years preceding retirement.

It is an interesting fact that statistics covering some 342,000 members of benefit associations show that the turnover of these members was but 33 per cent. It cannot, of course, be assumed that this low figure has been caused entirely by the work of the associations.

In organizing a mutual benefit association, the following suggestions, based on investigation of nearly 600 associations, should prove of assistance.[1]

1. The association must be *sold* to employees by regular selling methods.
2. A live secretary, working full time, and probably paid by the company, will do much to make a success of the association.
3. When employees managed alone, 30 per cent of eligibles enrolled; when employees and employers managed jointly 66 per cent of eligibles enrolled; when employers managed alone, 75 per cent of eligibles enrolled.
4. Dues should be collected weekly, and never by assessment.
5. Membership should not be compulsory.
6. New employees should be offered some small inducement, such as remittance of entrance fee, to join within the first few weeks of service.
7. An experienced actuary should be consulted for the establishment of dues and benefits.

Industrial hygiene is the latest contribution of the physician and the psychologist to industry. This movement received a great impetus from the psychiatric work of the Army, which work attempted to weed out recruits who were either mentally deficient, or mentally unstable. Industrial hygiene is analyzing the relation between working conditions and unrest, whether such unrest be manifest in strikes, turnover, bolshevism, nervous breakdown, vice, indolence or crime. Employers should foster this new movement with care, for it offers great possibilities to industry.

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[1] The Employees Benefit Association. W. L. Chandler. Industrial Management. January to July, 1918.

In organizing the health division, the fourfold division used in this chapter can readily be adopted. Usually, if the health director is himself a physician, he will direct the activities of the medical section. A competent sanitary engineer should be given the supervision of the work of sanitary installation and inspection, and a recognized safety engineer should be assigned to the field of accidents and safety. The responsibility for the benefit association should be placed entirely in the hands of the secretary. The chiefs of these four sections report directly to the director of the health division, who in turn reports to the personnel manager.

The director of the health division need not necessarily be a physician. In some concerns the safety work is of such magnitude that the man who heads it is of very high calibre, easily capable of directing the entire health division. The actual working out of authority will depend upon the abilities of the men at hand. But it is certain that the man at the head of the health division should understand thoroughly the problem of the entire division and of the rest of the department, and should be a good executive, capable of assigning a task in the large and of securing results.

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CHAPTER XI

MAINTENANCE OF THE WORKING FORCE

Most employers suffer from the delusion of the square peg in the square hole theory: put a worker into the job for which he is eminently fitted, and he will remain there, a satisfied, capable producer. In practice, conditions are quite different. We neither know the size and shape of every job for which a worker is to be found, nor can we yet measure the size and shape of the peg which applies for the particular job.

Consider the contrasting viewpoint. A work-life is created when a new employee begins work, and ends when he leaves. This work-life is a living relationship which must be kept alive by proper nourishment. It thrives on adequate wages, healthy working conditions and human treatment. It is the task of the maintenance division to remove all factors which stunt the growth of healthy work-lives, and to supply conditions which foster their development. Employers cannot long continue to allow the problem of labor maintenance to take care of itself. Constructive policies of follow-up must be adopted, and carried out in detail. If a man is worthy of employment, he is surely worthy of retention. Every company must deal with the individual worker just as it deals with the individual customer.

Many concerns have realized the value of maintaining personal contact with every employee, and have attacked the problem through various channels. Foremen are being trained in the art of handling human material. Various committees of the workers are being formed, to take care of many phases of personal relationships. The individual efficiency of each employee is being measured, so that promotions may be rapid and just. Opportunities for advancement and recreation are being created. Cooperation in management is being attempted. Although these various activities are seemingly unrelated, they all have for a prime object the maintenance of a reasonably contented working force.

The maintenance division has the task of establishing relations with individual workers, and with workers in groups. Rating the efficiency of each employee certainly is an individual problem, as are transfers or legal service. On the other hand, such problems as housing, restaurants, collective bargaining and athletic associations, are problems of group relationships. Whether or not there is a separate division in every organization for the express purpose of handling this twofold problem, the necessity for meeting it is ever present.

Ascertaining the value of each employee is a basic step in the work of the maintenance division. It is first necessary that his history previous to employment and his present extra-company activities be understood. His experience and schooling will usually be indicated on his qualification card. Whether he is attending a night school, or taking a correspondence course, should be known. His intelligence score and accurate ratings will serve to indicate his potentialities. All of the foregoing will afford a basis for a better understanding of his present performance.

The present efficiency of the employee is determined be many distinct factors, some tangible and some intangible. Unmeasurable qualities, such as loyalty, tact and the like, will not be considered—perhaps attendance figures, or the rating scale, will cover much the same ground. The following list includes various items which are obtainable from well kept records, and which can be used in determining an employee's value to the company.

Factors in Determining an Employee's Value To The Company

1. Production
2. Tests of ability
3. Periodic rating by superiors
4. Rapidity of advancement
5. Attendance and lateness
6. Suggestions
7. Errors
8. Accidents
9. Disciplinary measures

Production is, undoubtedly, the one big criterion of the success of the individual. If all the other factors are perfect, yet production far below average, the employer does not value the worker highly. Conversely, the employee may lack many other virtues, but if he is a high producer, the chances are good that he will be retained. Accordingly, in estimating the value of the worker, his production record must be weighted rather heavily. The importance of accurate *measures* of production immediately becomes evident.

In a previous chapter on Rating Scales, it was pointed out that these are most useful where the measurement of production is difficult or impossible. Service work, repair work, considerable clerical work, and practically all executive work, can be included under the heading of unmeasurable. Standardized judgment must be resorted to. An output becomes measurable when it results from a repetitive operation resulting in similar units of product.

There are many methods of measuring a tangible output, such as the piece-worker produces. Practically all of these methods amount to a computation of the number of units created per hour, or per day. Automatic counters are useful in connection with mechanical, repetitive operations such as punching or stamping. There are records for trucks and automobiles which indicate the time in motion and the time at rest. The work of the typist is being measured in the number of machine strokes, in the number of square inches turned out, or in the number of lines of a standard length. We are approaching the time when we shall know how many letters can be opened and sorted per hour. Time and motion studies afford a ready means of establishing standards of performance—the next problem is to measure production in jobs where the nature of the work varies from hour to hour.

Wherever possible, production should be expressed in dollars. This supplies a common basis for all workers, and thereby facilitates comparisons. It is, of course, erroneous to assume that a man's value is determined entirely by the number of dollars he receives weekly. But a comparison of a worker with his own group is usually quite fair, and readily reveals the low and high producers. Where workers are not paid on a piece-work basis, individuals should be compared in units of production. A simple method is to assume the group average to represent 100 per cent. For instance, if one group averaged ten units per hour, and worker X in that group turned out twelve units per hour, then his index is 12/10ths, or 120 per cent.

Tests of ability can be used periodically to ascertain the value of an employee, regardless of his production record. Performance tests will usually be most satisfactory, but suffer all the disadvantages of the use of such tests in initial selection. Tests of technical information, or knowledge about the job, will usually reveal startling gaps in the knowledge which an employee has "picked up." If promotion is contemplated, tests of information covering the next higher job can well be used, although the worker could not be expected to be proficient in the mechanical details of that job. All tests should, of course, be standardized, so that definite scores will have definite meaning.

The progress chart of each worker is usually a good indicator, for it will often show those workers who have been advanced too rapidly, those too slowly, and those deserving of further promotion. Such a chart in graphic form is easiest to interpret.

The problem of attendance and lateness in industry is exceedingly difficult, for it is chronic and innate in all mankind. There are many surface reasons given for absence and tardiness. Many workers who find themselves late, simply take the day off, particularly if they are piece-workers and realize that they can make up the financial loss by extra effort. Of the days in the week, Monday is a particularly flagrant offender, as are the days after holidays and paydays. The weather and the time of the year contribute their share in absenteeism. The night shift usually suffers more than the day shift from all causes. Sickness is generally debited with fifty per cent of all absence, but this is undoubtedly too high. Women tend to absent themselves more than men, and even in greater proportion than the physiological sex differences might warrant. Accidents can be held responsible for a small percentage of absenteeism. Even such a trivial matter as the location of the time clock may account for a fair percentage of lateness. An actual habit of lateness on the part of certain individuals will usually explain a still larger percentage. Finally, in a time of surplus of jobs, an attitude of indifference results in greatly increased absence and tardiness figures.

There is no panacea for the attendance problem. Some firms have succeeded by certain methods of attack which have utterly failed in other organizations. It seems fairly certain that a reduction of lateness also brings about a reduction of absenteeism. The custom of inflicting fines for lateness has come into disfavor with many concerns, because it is believed that the constructive way is better. Accordingly, inter-departmental competition for the attendance record is fostered, or bonuses, are awarded. The Ford Company reduced absences from 10 per cent to 0.5 per cent by the use of home visitors. Improved safety work, rest periods to eliminate fatigue, and periodic physical examinations attack one vital aspect of the attendance question. Finally, it is important that the employee should be doing work for which he is fitted, and that he realize that his attendance record is taken into consideration at time of promotion.

One of the simplest methods of computing an attendance index for each worker is to add the number of hours actually worked to the number of hours lost through no fault of the worker, and then to divide by the number of hours scheduled. This method gives a convenient percentage index. For example, if Harry White worked 39 hours, and lost 4 hours because of faulty scheduling of work, his index is 43/44 or 98%.

There are numerous minor factors which can be used in estimating the working value of each employee. Suggestions for improvements can be stimulated by proper advertising methods, and by judicious awards. In 1916 the Eastman Kodak Company adopted 1000 out of some 2300 suggestions turned in. Many firms record all errors made by workers, and consider these in making promotions. Similarly, accidents due to the employee's negligence are noted. When disciplinary measures have been necessary these, too, are debited on the progress record. Just what importance shall be attached to these minor items must be determined by the one who reviews the progress cards for promotions and transfers.

The accompanying Individual Progress Record (Fig. 22) suggests a combination of record and graphs which can be compiled without much clerical effort and which affords valuable data on each worker. During the month of January, 1920, Harry White lacquered 2352 pieces, whereas the average of his group was 2400 pieces. His productive efficiency was then 2352/2400 or 98%, which equals 49 points for production. His attendance was perfect, for which he is credited with 25 points. The value of his suggestions contrasted with his errors, etc., was estimated to be worth 10 more points. His total efficiency, or value to the company, then equals 84 points, and is plotted on the efficiency chart. The above method can readily be modified to meet varying conditions.

The first task of the maintenance division is to determine the value of every worker to the organization. The second task of the division is that of adjustment. Often, when an employee has been carefully followed up, it became evident that he should be transferred to other work. The maintenance division should have in record form proof of the desirability for such a move. There should be a readily accessible outlet for all grievances, for these often lose their sting when allowed vent, whereas trifles may assume great magnitude if pent up. The adjustment of wages is a delicate task in itself—the wise maintenance director accepts advisory powers only on this question. To adjust personal disputes between two workers, or between a foreman and a worker, often requires the wisdom of a Solomon. The maintenance director must, indeed, be " no mere man."

INDIVIDUAL PROGRESS RECORD

NAME—White, Harry JOB—Lacquer Finisher
FOREMAN—Martin, George DEPARTMENT—Finishing
FIRST EMPLOYED—2/21/19 RATE—Piece
Standards:

Average group production for month equals 100%, or 50 points

Average group attendance for month equals 100%, or 25 points

Value of suggestions and improvements, contrasted with losses from errors, preventable accidents and disciplinary measures—maximum number points—25

1920

PROD.	J	F	M	A	M	J	J	A	S	O	N	D
Points	49	45	48	47	50	49	54	52	..	..	..	..
ATTEND Points	25	24	25	25	22	23	25	27	..	..	..	..
MISC. Points	10	18	15	22	21	24	18	20	..	..	..	..
Total Efficiency .	84	87	88	94	93	96	97	99	..	..	..	..

1921

PROD.	J	F	M	A	M	J	J	A	S	O	N	D
Points	..	..	..	..	..	..	..	..	..	..	..	..
ATTEND Points	..	..	..	..	..	..	..	..	..	..	..	..
MISC. Points	..	..	..	..	..	..	..	..	..	..	..	..
Total Efficiency .	..	..	..	..	..	..	..	..	..	..	..	..

1922

PROD.	J	F	M	A	M	J	J	A	S	O	N	D
Points	..	..	..	..	..	..	..	..	..	..	..	..
ATTEND Points	..	..	..	..	..	..	..	..	..	..	..	..
MISC. Points	..	..	..	..	..	..	..	..	..	..	..	..
Total Efficiency .	..	..	..	..	..	..	..	..	..	..	..	..

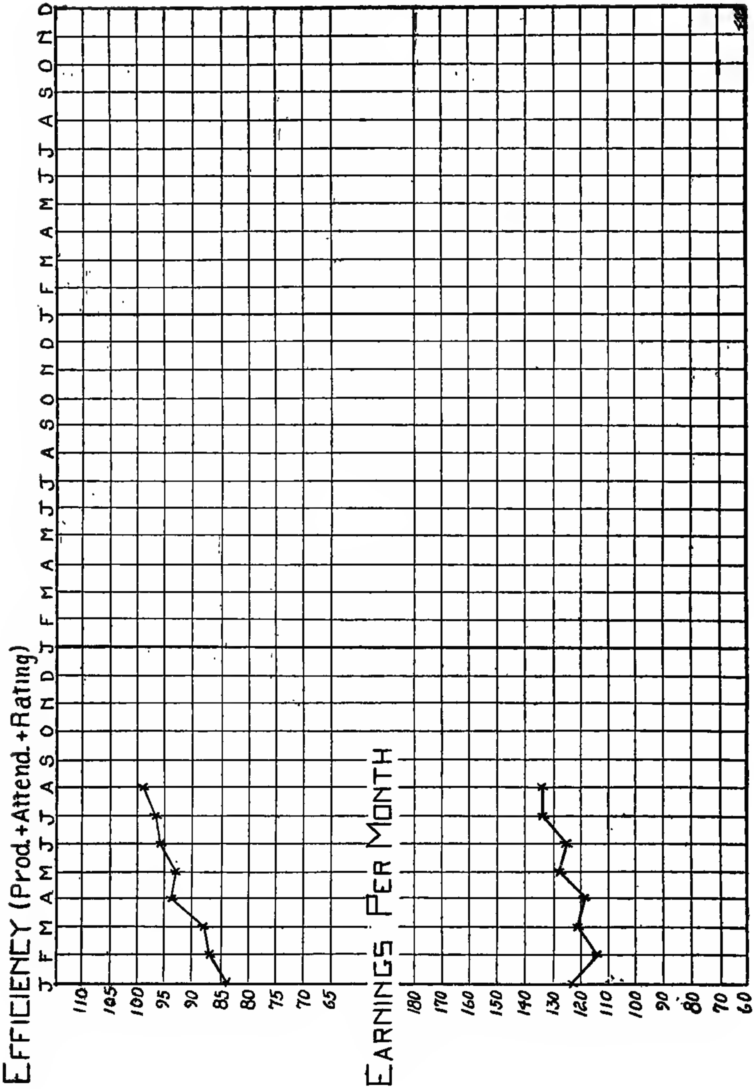
Efficiency (Prod.+Attend.+Rating)
110
105
100
95
90
85
80
75
70
65
Earnings Per Month
180
170
160
150
140
130
120
110
100
90
80
70
60
J F M A M J J A S O N D
J F M A M J J A S O N D
J F M A M J J A S O N D

Figure 22

There are many forms of personal service which the maintenance division can render to the individual worker. Legal aid, particulary for the foreigner, is especially necessary. The income law requirements are different for non-resident aliens. Many a foreigner has been helped through the bewildering paths to citizenship by the company legal adviser or notary public. The housing and lodging problem looms particularly large to new employees, but can be met by inexpensive real estate service. Workers are bound to get into financial difficulties, and will become ensnared by loan sharks unless the employer makes some loan provisions. Some companies even go so far as to pay bills for employees, and then to deduct small amounts from their weekly wages. A maintenance director who is capable of inspiring confidence will be enabled to give occasional personal and domestic counsel that prevents much unhappiness and keeps the employee contented on the job.

A very important duty of the maintenance division is the interviewing of all employees who leave. The employment director is not the logical person to do this interviewing for relatively few sever employment because they are absolute misfits. The maintenance director will invariably secure valuable information from departing employees which will reveal unsuspected working conditions and petty animosities.

In one city a number of concerns have agreed to give discharge papers to those leaving, and to request these papers from applicants coming from a company where such are given. Essentially this plan amounts to demanding that an applicant possess an honorable discharge from his previous employer. The experiment is being watched with keen interest.

Efficiency ratings, adjustments, and personal service, are all concerned with relations of the maintenance division with the individual. But quite as important are the various types of group relations. Collective bargaining is one of the most important of these. Shop committees and other forms of participation in management consitute another important group contact. Both collective bargaining and employee representation are so vital that the chief executive usually accepts them as his own personal problems. Another important group contact is the movement commonly known as welfare work which has come into prominence within recent years despite powerful opposition.

Regardless of the justification of much so-called welfare work, the entire movement possesses a definite significance. It is a recognition of the fact that the individual demands more than mere wages as return for his services. Service and welfare features indicate a broadened outlook on the part of management, with a realization of the importance of the human factor in production. The success or non-success of service work in a particular company will depend upon the spirit in which it is administered. Where it has been successful, absenteeism, lateness and accidents have been reduced, working conditions have been improved and the interest of the employee in his work as well as total production have been increased. It is evident therefore that welfare work may be justified on a broad social basis, or on the narrow basis of a pure investment; it may be damned with equal force as paternalistic and undemocratic, or as a sop from management to the worker and to the public. In the final analysis of welfare work, managerial attitude is everything.

It is impossible to enumerate all the activities which may be included under the heading of welfare work. In practically all concerns where this work is definitely recognized, recreation in various forms constitutes an important part, as do lunch and rest rooms. Many of the activities which have already been included under the work of the educational division and of the health division are found as welfare work.

There are several guiding principles to be followed in the administration of service features. The employer must *believe* in the work, not as something which will calm the turbulent waters of labor troubles, but as a work which makes a man's job worth the doing. Before any feature is instituted, there must be a real need for that feature. Many welfare activities have failed miserably, because there was no demand existent or created. If a certain form of service is rendered with the right attitude, and if it meets a real need, then it is predestined to succeed.

It is a puzzling question as to whether the administration of welfare activities should be left entirely to employees, or whether the employer should retain some share of control. Some of the most brilliant successes, and some of the most disappointing failures, have resulted from the management of welfare activities by employees. And the same can be said of instances where the employer directed the activities. The division of maintenance is, of course, a compromise between these two extremes, and provides the safest procedure for welfare work, particularly at the outset. As soon as each new feature seems to be progressing smoothly, the maintenance director should attempt to make his own influence unnecessary by organizing officers, or a committee, to continue the particular activity.

The employer has a legitimate right to ask whether welfare work has shown any tangible results, granting that it has increased the worker's interest in his work, his satisfaction from the work, and similar intangible products. The following table (Fig. 23) taken from Bulletin 250 of the Department of Labor, Welfare Work for Employees in Industrial Establishments in the United

States, shows the effect of the work upon lost time and stability of the force. The preponderance of firms which reported improvements in these two factors alone over those which found no improvement, is striking.

ADMINISTRATION OF WELFARE WORK AND ITS EFFECT UPON TIME LOST AND STABILITY OF THE FORCE BY INDUSTRIES

Industry	Number of establishments	Number of employees	Welfare work administered by		Establishments having		Establishments reporting as to effect of welfare work upon			
							Time lost		Stability of force	
			Employer	Employer and employees jointly	Outside agencies cooperating	Welfare secretary employed	Improvement	No change	Improvement	No change
Automobiles	9	95,683	6	3	3	3	5	1	2	2
Boots and shoes	5	23,930	1	4	1	1	3	..	3	..
Chemicals and allied products	7	13,539	2	5	3	3	4	1	3	1
Clothing and furnishings	13	19,498	3	10	8	10	6	..	6	..
Electrical supplies	5	51,040	1	4	2	1	2	1	1	2
Explosives	5	36,030	2	3	4	4	2	..	2[1]	..
Fine machines and instruments	8	25,326	2	6	2	2	3	..	3	..
Food products	15	[1]17,638	12	3	6	3	8	..	5	1
Foundries and machine shops	49	143,882	28	21	12	16	18	6	18	8
Gas and electric light and power	10	[1]27,102	1	9	1	2	2	2	2	1
Iron and steel	[3]40	213,143	33	7	12	9	15	2	9	4
Mining, coal	12	34,807	7	5	4	1	6	3	3	6
Mining, other than coal	12	25,448	5	7	5	2	6	..	7	..
Offices	9	13,814	2	7	..	3	2	1	1	1
Paper and paper goods	7	9,174	3	4	3	2	6	..	3	1
Printing and publishing	10	12,769	5	5	3	4	4	..	4	..
Railroads, electric	17	60,642	6	11	3	4	6	2	5	2
Railroads, steam	10	393,593	4	6	8	1	2	1	2	1
Ruber and composition goods	9	42,847	5	4	3	6	4	1	3	..
Stores	47	[1]125,148	17	30	20	30	18	2	10	3
Telegraph and telephone	[3]15	[1]66,447	14	1	2	8	2	..	3	..
Textiles	60	[1]71,221	41	19	31	16	21	2	22	2
Other industries	57	[1]138,793	31	26	18	10	15	4	19	3
Total	431	[4]1,661,504	231	200	154	141	160	29	136	38

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[1] Not including employees of one establishment, not reported.

[2] Not including employees of two establishments, not reported.

[3] Individual plants of one corporation have been counted as separate establishments.

[4] Not including employees of seven establishments, not reported.

In this same report by the Department of Labor, the question of costs is considered. These are found to vary "from a fraction of 1 per cent to 5 per cent of the total annual payroll." The conclusion is furthermore reached that a "fairly comprehensive program can be maintained for about 2 per cent of the annual payroll."

From the very nature of the work of the maintenance division, it is evident that the one in charge of it must be able to get along well with the ordinary workman in the company. It is up to him and his assistants to make personal contacts as frequently as possible. The accompanying personnel specification for the maintenance director is offered as suggestive of the necessary duties and qualifications.

PERSONNEL SPECIFICATION

PAYROLL TITLE Maintenance Director Symbol M D

IMMEDIATE SUPERIOR Personnel Manager

NUMBER OF SUBORDINATES 4

DESCRIPTION OF JOB DUTIES

Directs the work of the maintenance division. Is responsible for the efficiency rating of every employee. Institutes or approves all transfers and promotions. Adjusts grievances and complaints, and interviews all men leaving the company. Directs the various welfare activities. May be called upon to represent the management in cooperative movements between the management and the force.

NATURE AND CONDITIONS OF WORK

Partly office work but may involve strenuous athletic activities.

MAN REQUIREMENTS

Physical—active, athletic type. Adaptable to both plant and office conditions.

Age—25 to 40 years

Intelligence—above average: A, B or C+

Education—high school or college graduate preferred. Should have a knowledge of all forms of athletics and outdoor recreation. Should understand time and motion studies. Knowledge of Italian and Polish desirable.

Temperament—active, even-tempered, not 'high brow'.

Social Qualities—a good mixer, congenial, sympathetic, democratic.

Experience—Y. M. C. A. or other social welfare work; athletic director; time and motion studies; other phases of personnel, or other work in the company; general administrative experience.

The work of each section of the maintenance division is fairly clear. The rating section will be concerned with gathering data on each worker to determine various indexes of the value of the individual to the company. The adjustment section will analyze all grievances and complaints, and will interview men who are leaving. The welfare section will be responsible for the proper administration of the various welfare activities, such as dances, athletic contests, restaurants and similar features.

The proper attitude is all important in any kind of betterment work. Workers resent charity sturdily—and rightly so. They resent paternalism—again rightly so. They do not resent the opportunity to do those things *which they want to do.* This statement may sound like a platitude, but it really sounds the keynote of success in welfare work. Satisfaction comes from participation in an activity, not from allowing it to be thrust upon one. First discover what workers want most to do. Then supply the means by which, with some cooperative effort, the end can be accomplished. By following this simple formula, welfare work can usually be started in the right direction, so that the human energies will pull for the new enterprise, instead of pushing against it.

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CHAPTER XII

INCENTIVES AND WAGES

This chapter will digress slightly from the beaten path of standard personnel progress, and attempt to present a viewpoint of psychology toward the human engineering problem. To this viewpoint will be coupled a discussion of the merits of various systems of wage payment.

Keen business men have long realized the value of the emotional appeal as contrasted with the intellectual appeal. The executive who attempted to prevent a strike among his men by picturing the misery which would fall upon the trusting wives and the helpless little babes probably succeeded; the executive who appealed in terms of duty toward Society and the community probably failed. There is a basic difference between these two lines of attack: one appeals to the emotions, the other to the intellect. The successful salesman long ago discovered the value of utilizing a man's love for his family, or his desire for fame, or his fear of competition. The personnel manager is essentially a salesman of an intangible product.

The attitude, or mental set, of a worker toward his work is all important. Fear of unemployment or big wages may cause a man to remain on the job, ostensibly working hard, but what that man thinks of his employer is quite as important as the amount he produces. His thoughts constitute his own emotional reaction toward the management—a reaction which is unanalyzed, which cannot be changed by pure reasoning, and which colors his entire worklife. How important it is then, that the employee's mental attitude be favorable rather than unfavorable,—conducive to steady, ambitious activity rather than to cunning and craft.

Men think things because they possess intellects; men *do* things because they are driven by instincts. This may be a radical viewpoint to those who have placed mankind on a pedestal as a rational being. But a moment's reflection will convince the most unbelieving of the truth of the foregoing statement. The reader himself may be convinced intellectually that his city government is rotten to the core—but he does nothing. However, let someone show him that he personally is paying, say, one hundred ~~and~~ ninety dollars yearly to keep a gang of politicians alive, and he immediately becomes angry, and stands ready to do something which will cause a change. In many southern states, trachoma is causing thousands of children to become blind yearly, but as a group, the citizens take no action. However, practically every father will spend hundreds of dollars in a fruitless effort to save *his* child, once it is evident that the child has the disease—the parental instinct results in action.

Psychology in recent years has stressed the appeal to basic instincts. When an instinct is aroused, emotions accompany. Some very curious bodily changes are brought about during the emotional state. The heart and lungs act more rapidly, causing the blood to flow faster, with consequent increased blood pressure. A sugarlike substance is poured into the blood from the liver. The sweat glands become more active. Blood is drawn from the digestive tract to the muscles, so that digestion ceases for some time. Finally, mysterious glands pour a substance known as adrenalin into the blood. Adrenalin aids many of the changes already mentioned, but in addition causes blood to coagulate more readily and temporarily negates the effect of fatigue poisons. As far as science has yet been able to determine, the same bodily changes occur no matter what the instinct which has been aroused. From all of the foregoing, it is quite evident that Nature prepares the body for great activity when instincts are touched and emotions stirred.

The worker at the bench who mutters sullenly to himself because the foreman has done him an injustice is suffering from emotional stress. He has a lot of pent-up energy which must come out in some form or other. He may fight with a fellow worker, or secretly break valuable material, or take it out on his family when he gets home—but come out it must.

Stirred-up instincts may do a lot of damage—or they may be guided into the proper channels and do a lot of good. Think how the young man who is engaged to be married will work just because of the drive of his mating instinct. Think how two gangs will compete because of the instinct of rivalry. Think how ambitious men will study at night after the grilling day's work, because of the instinct of leadership. Think how the faithful servant will labor for his master because of the instinct of loyalty.

Very, very few actions are performed because of one drive, or one reason. For instance, an employee seldom leaves a company for one cause—there is usually a complex of quite varied reasons, of varying importance. In ages past, one motive to work only was used. Perhaps that motive was the fear of the taskmaster's whip. Perhaps it was loyalty to a king, or a church. Perhaps it was fear of unemployment. In recent years, the pay envelope has been practically the only motive used, and dozens of wage payment schemes have been devised to urge the workers to greater efforts.

Without doubt, wages constitute the most important motivation for the majority of workers, but even for these individuals, appeal should be made to various subsidiary motives. But there is an important minority to whom the pay envelope has less appeal than opportunity for promotion, desire for pleasant environment, love of leadership, active competition with fellow workers or with representatives from other companies, approval of friends and fellow workers, desire to be with a group of people, etc. For such individuals—and they usually are fairly ambitious and competent—other springs of action should be touched. It is the task of the personnel department to discover the motives impelling *each* worker in his work, and to supply opportunity for the operation of those motives. To many this statement may sound like pure theory, but it is being done quietly in numerous concerns. If care is taken that individual relationships are established between the worker and foreman, or between the worker and some one from the personnel department, it is not particularly difficult to discover the relative importance of various motives for different men.

What then are some of the instincts which operate in industrial life, and to which appeal can be made? The mating instinct is one of the strongest, and is aroused by references to wife, children and home. All men desire the approval of others, and fear their disapproval. The fighting instinct becomes constructive when it is manifested in good-natured rivalry. The instinct of leadership is strong in a small per cent of mankind at all times, and in all men on occasions,—known lines of promotion become a direct challenge to it. The converse of the desire for leadership is the instinct of submission, or loyalty, which even the strongest exhibit at times, and which a large majority of men *want* to exhibit most of the time. Men like to work in groups—the industrial hermit is a difficult individual to find. All people, young and old, have a desire to manipulate objects, such as a pencil, a watch-fob, a drill press, or the steering wheel of an automobile. Closely related to this desire is what has been called "the creative impulse." Men like to have a sense of worthwhileness in their work: a man's self-esteem is measured by the amount of his success divided by his ambitions. People appreciate tasty food, for the eating instinct is as old as the race. Finally, men desire money, but this desire is not instinctive—money in itself means little to the child or to the savage. Money is only useful in that it aids the satisfaction of impelling instincts.

The employer, or the personnel manager, who makes a careful study of his working force from the viewpoint of instincts will undoubtedly realize the numerous channels of action that are not being utilized.

The strength of instinctive urges is no new thing. For ages men have struggled for position, honor, fame—and have gloried in the power and pride of such positions. For ages men have struggled against men, singly and in groups. For ages men have worked and have become martyrs because of loyalty to someone or some group: the wife, the family, the tribe, the nation. For ages men have been attempting to secure greater opportunity and better well-being for themselves and for their children. Psychology has found nothing new by any means, but has merely recognized what has hitherto been existent but unrecognized.

Perhaps the reader feels that instincts are, after all, theoretical entities, that they have little usefulness in industry, that the pay envelope is sufficient to stir up the urge in practically all instincts. The following method applies the touchstone of mathematics to the instinct of competition and transmutes the group efforts into the pure gold of larger and more efficient production.[1] It is based upon the assumption that a wide range of ability within a group of workers, all of whom turn out the same unit product, is wasteful: that such range tends to dishearten the poor worker who cannot keep up with the pace and to suppress the good worker who is fitted for higher tasks. Conversely, it is believed that a group of workers which is compact regarding productive ability encourages healthy competition among its members and neither wastes the abilities of good workers nor suffers from the inability of poor workers.

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[1] The author is indebted to the editors of Factory for permission to reprint this material.

If the above statements are true, then a reliable index of the range, or scatter, of ability within a group is *one* index of the efficiency of that group and may therefore be used as a basis of comparison between two groups turning out utterly different units of product.

The average deviation, or A. D., is a simple measure of the range of ability within a group, and is calculated as follows:

1. Find the average production for the group.
2. Calculate the amount that each worker deviates, or varies, from this average, whether above it or below it.
3. Add up these deviations and divide by the number of workmen, i. e., find the *average* of the deviations.

The following examples show the method of computing the A. D. for four groups of workers. Each group, let us assume, turns out a different unit of product in one plant. In groups I and II the average is the same; in groups II and IV, the A. D. is (approximately) the same; in groups II and III the relation of the A. D.'s to their respective averages (the "scatter ratio") is the same.

If we decrease the size of the A. D. then we have decreased the range of ability, i. e., the group becomes more homogeneous. The A. D. is *not* a measure of group production, nor is it necessarily affected by the increase or decrease of such production. The A. D. furthermore provides a lower "cutting point" below which workers may be considered as liabilities rather than as assets, and

	GROUP I			GROUP II			GROUP III			GROUP IV		
	Workman	No. units per hour	Deviation	Workman	No. units per hour	Deviation	Workman	No. units per hour	Deviation	Workman	No. units per hour	Deviation
	A	12	3	H	6	9	O	40	60	V	2	8
	B	13	2	I	9	6	P	60	40	W	5	5
	C	14	1	J	12	3	Q	80	20	X	10	0
	D	15	0	K	15	0	R	100	0	Y	15	5
	E	16	1	L	18	3	S	120	20	Z	18	8
	F	17	2	M	21	6	T	140	40			
	G	18	3	N	24	9	U	160	60			
TOTAL=		7/105	7/12		7/105	7/36		7/700	7/240		5/50	5/26
AVERAGE=		15.	1.7		15.	5.1		100.	34.		10.	5.2
SCATTER RATIO		= $\frac{1.7}{15.0}$ or 11.3%			$\frac{5.1}{15.0}$ or 34.0%			$\frac{34.}{100.}$ or 34.0%			$\frac{5.2}{10.0}$ or 52.0%	

an upper cutting point above which workers may be considered as exceptional. Thus the lower cutting point of production supplies a definite measure of minimum attainment which experienced applicants or employees-in-training must reach before it is safe to place them at work, and the upper point becomes a measure above which workers should be in definite line for promotion.

There is a logical method for the use and interpretation of the average deviation of production which will probably hold for any group. Whenever possible, the A. D. for any given period should be compared with that of a preceding period of corresponding length. A small A. D. (compared with such previous periods) indicates that the members of the present group are more alike in productivity than was the case in the previous group, or previous period. This homogenity may signify pace setting and limitation of output by the workers, or that there are few very poor and very good workmen in the group: the proper condition.

A large A. D. indicates a great diversity of productivity. Such diversity may be due to the condition of certain workers "soldiering" on the job or being incapable of performing the work required of them, or possibly that certain speedy workers are setting a rapid, and often killing, pace. Certainly a large A. D. means that there is a group of poor workers who are considerably below the average production and who are, therefore, poor investments. To determine the point of production below which workers may be considered poor, simply subtract the A. D. from the average. It can be shown mathematically that this poorest group will usually be 21.5% or roughly one-fifth, of the entire group. In the figures given for Group I any workers who produced fewer than 13.3 units per hour should be classed as poor workers *for that group.* Conversely, any who produced more than 16.7 units per hour should be classed as exceptionally good workers for that group, other things being equal.

The A. D. becomes a constructive index when the attempt is made to decrease its size. For instance, if the poorest workers in Group I, "A" and "B" are transferred to other work, and for them are substituted "a" and "b", who are merely average producers (15 units per hour) there is a noticeable increase in total production and a decrease in the size of the A. D.

In interpreting production records of any group, it should constantly be kept in mind that the aim is not only to increase the average but also to decrease the A. D.

Different groups can be compared by means of the "scatter ratio." This index is merely the ratio of any A. D. to its average, expressed in per cent. Referring to Groups II and III, it is evident that the figures of production alone give no clue to the scatter of ability with-

GROUP I AFTER TRANSFERS

Workman	No. units per hour	Deviation
C	14	1.7
D	15	.7
E	16	.3
F	17	1.3
G	18	2.3
a	15	.7
b	15	.7
TOTAL=	7/110	7/7.7
AVERAGE=	15.7	1.1

SCATTER RATIO $= \frac{1.1}{15.7}$ or 7.0%

in either group. Nor does a comparison of the respective A. D.'s aid us (5.1 against 34). But the ratio of each A. D. to its averages reveals the fact that the scatter of ability of the two groups is the same (34%). However, from the standpoint of managerial conservation, in neither of these groups are the abilities of the individual members being used so efficiently as in Group I, where the workers are neither much above nor below the average in production. The scatter ratios express the comparison numerically.

The plant scatter ratio is merely the weighted average of the *group* ratios. For our original force, consisting of 26 workmen divided into four groups, the plant scatter ratio would be calculated as follows:

Group	Scatter ratio		No. men in group		Total	
I	11.3	x	7	=	79.1	
II	34.0	x	7	=	238.0	
III	23.0	x	7	=	238.0	
IV	52.0	x	5	=	260.0	
TOTAL			26		26/815.1	(PLANT
AVERAGE					31.3	(Scatter (RATIO

Just as the group scatter ratio is an index for the gang boss or group foreman, so the plant scatter ratio acts as a red light for the general manager. For when either one becomes larger from one month to the next, it indicates either that the average production has fallen or that the scatter of ability has increased, or both. Either condition demands the immediate attention of the executive in charge.

To summarize:

1. In decreasing the A. D. of any group by transfers, promotions, etc. we cause workers of exceptionally poor, and exceptionally good, ability to "gravitate" toward their proper levels.
2. By comparing the scatter ratios of different production groups, we discover those groups in which high ability is being sacrificed and low ability is retarding.
3. By securing the plant scatter ratio we obtain an index that varies directly with two factors which have great weight in managerial success: total production and the proper utilization of workers' abilities.

The above method applies only to those groups where production is measurable in some unit or other. The reader who is unfamiliar with some of the terms used, will probably have difficulty in following each step, but several readings will make clear how a single index to show the compactness of workers' abilities, which compactness appeals to the instinct of rivalry, can be secured.

In a similar manner, lines of promotion and transfer appeal to innate desires for opportunity and change; suggestion awards appeal to the creative instinct; service buttons appeal to the instinct of display.

Habits are greatly akin to instincts, except that they have been acquired. The personnel manager will do well consciously to form good working habits, and to break up bad ones. The habit of being on time is as readily formed as the habit of being late. Again, workers have a tendency to stereotype the amount of output. Thus, Lee in his admirable little book entitled The Human Machine and Industrial Efficiency, cites the instance of a lathe worker who turned out exactly 1000 pieces on 44 out of 45 nights observed. Conscious limitation of output is not the only factor which may cause such a condition to exist,—working habits are highly important also.

This chapter makes no pretense of belittling the importance of wages. There is no doubt that for the great majority of workers, the largest proportion of the energy put forth is in response to the incentive of the almighty dollar. A knowledge of wage payment plans, then, is of considerable value to the personnel manager. It is impossible, in a book of this nature, to make a comprehensive study of the various wage plans which have been put forth from time to time. In preference, therefore, we shall consider the bases of these plans.

The worker may be paid for the time which he puts in, for the work which he produces, or for varied combinations of the two. The hourly rate, the day rate, weekly, monthly or yearly salaries are all familiar examples of payment for time. The Rowan and Halsey plans are comparatively newer methods of wage payment based on the time factor. The piece rate is the purest example of payment by product, but the sliding scale and the plans of Taylor, Emerson, and Gantt, are of similar nature. Profit sharing, stock owning and the Priestman plan now being tried in England are all payment for service plus production.

The Rowan, Halsey, Taylor, Gantt and Emerson plans are all based on the standard time in which a particular job should be done. The first two set this standard time on the basis of experience, observation, or the average time in which the job previously has been done. The last three, however, utilize time and motion studies in order to establish the best method of doing the task, to find the proper time, and to set a standard of performance which only high grade workmen can attain.

Inasmuch as the reader may have difficulty in discovering in current literature the nature of the Priestman plan of "payment by results," a brief outline of its nature is here given. The company has issued a statement to the following effect:

> The (Priestman) system is based on the principle that if a given number of men in a given time are capable of producing on the ordinary method of day rate working a certain quantity and type of finished machinery (called the "Standard output") then if, by greater collective individual effort—that is, without increasing the number of men or working any longer hours per man—they can increase the output of such machinery, it is possible to advance their total day rate wages by a percentage equivalent to that by which the standard output has been increased."

The scheme has been worked out on the basis of points for different kinds of production and according to reports is proving very satisfactory.

Fortunately for industry, no working force is ever absolutely contented. Some degree of discontent results in change, and change alone contains the possibility of progress. But a reasonably contented working force permits of gradual change. Evolution is usually much preferable to revolution. The employer has a perfect right to desire a reasonably contented group of employees. Many factors enter in to accomplish this end. Wages must be adequate in amount, proper in method, and adapted in frequency of payment to the social level of workers. Health conditions must be right with opportunity for competition and physical activity. There must be room for ambition and recognition of ability, to encourage mental expression and consequent progress. Men must feel the *worthwhileness* of their jobs, and must be assured of permanent work. Finally, workers must have confidence in their leaders—must believe in their ability, and must feel their bigness and justice. The vast majority of work-lives will thrive under such conditions.

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CHAPTER XIII

EMPLOYEE REPRESENTATION

The subject of employee representation is one of the most recent and one of the most significant modern personnel movements. It has many staunch supporters—and many bitter opponents. On the one hand it is claimed that it is nothing more than the proverbial stick of candy given by capital to labor; on the other, it is asserted that employee representation is an attempt of radical socialistic elements to bring about a communistic regime of industry. The true significance of the movement undoubtedly lies between these two extremes.

No one to-day denies certain rights of the worker. He is entitled to a compensation which will enable him to live, to raise a family, to educate his children and to provide for old age. Exactly what that amount will be must depend upon many other factors, such as social status, supply of labor, competition, etc. Every man has a right to demand just treatment in his working relations, and an opportunity to advance. Workers are coming to realize the value of healthful and safe, working and living conditions. These factors include housing, sanitation, transportation and opportunities for education and recreation, whether in the plant or home. Men desire the sense of security, or steadiness, of work. Whiting Williams tells of miners waited for the deep-throated whistle that told quite dramatically of how, at the end of the day, hundreds whether there would be work on the morrow and how, when the whistle had blown favorable tidings, each grimy-faced worker rendered thanks in his own way, be it by profanity or prayer. An important item which is so often overlooked is the fact that a man wants to feel a sense of worthwhileness in his work—and wants others to feel it. There is a story told of a bet made as to whether a man would work for money alone, regardless of the nature of the work. A hod-carrier was paid twice the usual rate to carry bricks from one pile to another, and then back again. The first worker quit after one day's labor. The second quit as soon as he realized what was expected of him. The nature of the work spread so rapidly in the community that it was impossible to get a third worker, so the bet was decided. Without a feeling of doing *worth-while* work, any task is mere drudgery. Contrast the attitude of the corpulent business man who forces himself to run half a mile daily, with the zeal of the college athlete who is looking forward to the intercollegiate track meet.

At present there is much contention as to whether workers want a voice in the management of industrial enterprises. Some authorities claim that class consciousness has so developed that workers are preparing to take over managerial problems, as has been done in the Cooperative Shingle and Lumber Mills of Washington. Other authorities assert with equal positiveness that workers do not want the responsibilities of management—that they do want simply the square deal. Midway between these two views is that which believes workers want a voice only in those matters which affect them.

Evident inefficiences of management, although often relatively minor, have undoubtedly contributed to the desire of workers to have some voice in management. On the one hand, management discharges the dishonest workman who steals material worth several dollars, for use in his home; on the other, it allows machinery worth several hundred dollars to rot and rust under open exposure. Which act involves the greater loss to society is a delicate question.

The surface causes of distrust between management and men are not difficult to trace. The factory system has caused an ever widening breach between the two. This has meant that the worker no longer understands the problems of management; management no longer understands the difficulties of the worker. Each is ignorant of the other's point of view. Employees believe that the employer is reaping huge profits at their expense; the latter believes that his men demand exorbitant wages and give indifferent service. The fear of unemployment and its train of consequences is usually sufficient to keep men at work—but it will not secure the *best* work.

Organized labor has exerted a tremendous pressure on the employer. One of its basic demands has been that the latter recognize the union, which has usually meant a closed shop. Collective bargaining and the right to strike have practically been conceded to organized labor. Through shop propaganda the ranks of unions have been strengthened greatly. Much shop propaganda is injurious to society, for it insidiously implants beliefs that are false. Few employers have yet realized the value of advertising to combat the soapbox orator. The fundamental demands of unions have been those for higher wages and shorter working hours. Economically the only justification for increased wages is larger production, unless workers have not been receiving a living wage. Shorter hours require greater efficiency on the part of the worker, if production is to be maintained.

Unions have furthermore brought about the payment of uniform rates, and have backed the limitation of output. There is no doubt that both of these are socially and industrially injurious, for they repress the superior workman and inculcate habits of soldiering. In their demands for less specialization of work, unions have probably acted as a proper deterrent to a movement which would have engulfed the individuality of workers and would have changed workmen into industrial mechanisms. Organized labor has stood for many conditions which now are admittedly right from every point of view. Workers are entitled to some assurance of continuous employment, to safe and sanitary working and living conditions and to better community and educational facilities. In final summary, history will probably show that unions have preserved the industrial order against destructive encroachments by unscrupulous individuals—unfortunately, their methods have often reverted to a more primitive state of civilization.

Management has reacted to the demands of organized labor in varying ways at different times. Probably the first step was an attempt to disregard entirely the existence of such things as unions. When this method failed—perhaps because the "non-existent unions" caused employees to go on strike!—blacklisting of workers, and lockouts of the entire force became the prevalent fashion. But wiser leaders realized that strife between capital and labor defeated the ends of both. Constructive measures were substituted for the former destructive weapons. Bonuses for extra-production, for better attendance and for improvements and suggestions were offered. Schemes were devised by which employees shared in the profits of the business, in addition to receiving their regular wages. Benefit associations were organized to assure the worker of aid during emergencies, and to insure some degree of security for old age. The foregoing typify the means by which the employer *gave* to the worker whatever seemed best adapted to result in content and permanency. The new features came to be called welfare work, and as soon as the employee realized the paternalism in it all, he began to oppose it with might and main. Employers considered their workmen ungrateful, instead of getting the viewpoint of the latter and of realizing that few people want charity in any guise whatsoever.

Participation in management has sprung up from many causes. In some companies it has merely been a growth of minor committees. In others it has developed from the suggestion system. Some employers have felt it to be an easy way to combat unionism; others have had sufficient faith in the fairness of mankind, and of their own men, to grant a voice in the conduct of the business.

Whatever the origin, it seems fairly easy to divide present types of participation in management into three classes. In the first of these employees have advisory functions only. Meetings amount to little else than an opportunity to talk over minor grievances and to make suggestions. Even associations of such unimportance will tend to promote a better spirit of cooperation. The second type is that in which employees have the power to decide certain issues, but such decisions must have the approval of the management. In the third type of managerial participation, employees have the power to make final decision on certain matters, or have power to pass a decision over the veto of management. In actual practice the last is very seldom found. Unions are strongly opposed to employee representation, for it makes the working force of each plant a unit, rather than the trade or craft. Employees in a particular organization become far more interested in securing better conditions and higher wages for themselves than in obtaining the same end indirectly by combining with workers from other plants. Present trends would indicate that sooner or later trade-unions in present form must disappear, in favor of either employees' associations in every concern or of a national scheme such as that worked out by the Whitley Committee.

The economic reconstruction following the recent war gave great impetus to various forms of employee representation. In England the now famous Whitley Report outlined a comprehensive system for the organization of English industry. In our own country the National War Labor Board installed shop committees or employee representation plans in dozens of large concerns. An experiment which is being watched with keen interest is the recently created Kansas Court of Industrial Relations, to which industrial disputes must be submitted. This consists of a tribunal of three judges which in the words of the law is "given full power . . . . to supervise, direct and control the operation of the industries, public utilities and common carriers in all matters . . . . specified and in the manner provided."

The National Industrial Conference, held in the latter part of 1919, promised much but gave little. The labor section of the conference backed solidly the usual program of organized labor; the employers' section merely outlined general principles for the management of industry; the public section endorsed the comprehensive program of the Secretary of Labor. The final report, issued on March 6, 1920 suggests "a system, nation-wide in scope, with a national industrial board, local regional conferences, and boards of inquiry whose functions are defined by geographical rather than industrial limits.[1]"

The National Association of Corporation Schools, in one of its valuable bulletins, lists the following fifteen purposes of employee representation:

1. To restore, at least in part, the closer contact between employers and employees which existed in the earlier days of industry.

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[1] Monthly Labor Review, p. 34. April, 1920.

2. To furnish a means by which employees can present grievances as they arise, before they assume serious proportions.
3. To give employees a voice in determining the conditions under which they shall work.
4. It affords a channel through which disputes, which might otherwise cause serious industrial trouble, may be adjusted amicably.
5. To create such an atmosphere that trade disputes will never be carried to the breaking point.
6. To pool schemes and suggestions for the better conduct of industry.
7. To enable individuals to present grievances to those in a position to be best informed about the merits of their cases.
8. To enhance the importance of the human element in the operation of industry.
9. To make foremen less objectionable as task-masters who owe their preferment to their success in getting as much as they can out of the men at the least expense to the company.
10. To give employers and employees a better mutual understanding.
11. To avoid discontinuance of production and to maintain maximum production necessary to mutual interest.
12. To provide regular facilities for access by employees' representatives to the management and for consultation by the management with representatives of the company.
13. To give the employees an opportunity to discuss the conditions under which they operate and a means of adjustment through chosen representatives.
14. To enable employees to increase their earnings by increasing their knowledge of industrial processes and their interest in the work in which they are engaged.
15. To further the common interests of the employees and management in all matters pertaining to plant organization, efficiency, and general working conditions.

There are certain basic principles to be observed in the establishment of employee representation. Workers must understand fully the aims and operation of the plan. Whatever representatives are to be chosen should be selected by secret ballot from among the members of the working force, but should not in numbers constitute a large, unwieldy body. The limits of jurisdiction and powers placed in the hands of the association should be made clear at the very beginning. Broad-minded executives should be selected to represent the management. The personnel manager should be one of these. Problems for consideration should be carefully prepared in advance of meetings, and should be of a concrete nature. Both management and men should be utilized in the collection of facts necessary to the solution of these various problems. Periodic meetings should be held for the frank discussion of policies, disputes and improvements. Finally, instruction and recommendations within the power of the organization should be formulated, and should be considered as binding upon the parties concerned.

The importance of the employees' association is really determined by its scope and powers, and not by its size or popularity. Ordway Tead has suggested the following as proper subjects of consideration by such an organization, although not necessarily as subjects over which the association has final power of decision:

SUGGESTED SCOPE OF EMPLOYEE REPRESENTATION

1. Accidents and safety first work
2. Sanitation and upkeep
3. Elimination of waste
4. Grievances and discharge
5. Cooperative enterprises.
    a. Buying
    b. Benefit associations, etc.
6. Standards of work
    a. Amount
    b. Time
7. Standards of pay

Two hundred and fifty cases that had been decided through the representative shop committee of a large steel company were classified as shown below. Eighty-five per cent of these cases were settled in favor of the employees.

Percentage Classification of Shop Committee Discussions

		Percentage
1.	Employment and working conditions	30
2.	Wages, hours of work, bonus, piece work and tonnage schedules	20
3.	Health and working sanitation	10
4.	Practice methods and economy	10
5.	Safety and prevention of accidents	10
6.	Employees' transportation	10
7.	Housing, domestic economics, living conditions, education and publications, pensions and relief, athletics and recreation, continuous employment and conditions of industry	8

The items for possible cooperative action may readily be grouped under three main headings, viz., shop activities, adjustments and participation in managerial functions.

In this chapter, three representative plans will be studied. The Whitley Report in Great Britain has aroused so much comment that it warrants careful consideration. The Leitch plan, whereby the industry is organized like our federal government, represents an interesting angle. The third method of representation to be here considered will be that which is commonly known as the Rockefeller plan. Each of these three presents a different mode of attacking the problem. The aim of the Whitley Committee is to organize industry into a national hierarchy; the aim of either the Leitch or Rockefeller plans is to combine the management and working force of each plant into a cooperative unit.

The Whitley Report attempts to apply the principle of representative government to all British industry. It recommends that in the various industries there should be formed three types of industrial council: national, district and works. In the works council, or committee, representatives of the employer and of the employees meet in joint conference for consideration of those problems which involve the welfare of the particular organization, and cooperate with the district and national councils. District councils are composed of representatives of district trade-unions and employers' associations, and are responsible for the application of the general principles laid down by the Central National Council, making such adjustments as seem necessary to meet local circumstances. Similarly, the national councils would include representatives of the national trade unions and of national employers' associations. In those industries which are at present unorganized, the report suggests that the Ministry of Labour supervise the formation of national councils. A single sentence of the Whitley Report sounds its keynote: "Problems old and new will find their solution in a frank partnership of knowledge, experience and goodwill."

The Whitley system has one outstanding disadvantage. Undoubtedly it would tend to further cooperation and harmony between the employer and the employed. But no provision is made to safeguard the interest of the consumer. An industrial and political combination of capital and labor would indeed be a menace to society.

The Leitch plan of industrial democracy is based upon the form of our federal government. There is a cabinet composed of company executives, a senate made up of department heads, and a house consisting of representatives of the workers in the various shops and offices. Freedom of speech, particularly in the lower house, is encouraged. Committees aare appointed to investigate complaints, or to formulate new methods of work.

The founder of the industrial democracy plan, John Leitch, asserts that, "In all of the great number of establishments in which this system has been tried, surprising savings of all kinds, surprising increases of production, have been brought about, and an American citizenship has been formed." He furthermore states, "It never becomes necessary for employers to limit the power of these internal legislative bodies, for invariably they place limits on themselves; men never once in my experience have been willing to take on themselves any responsibility which they have been incapable of carrying."

More specifically, Mr. Leitch declares that it has increased production from 30 per cent to 300 per cent; that it has eliminated labor antagonism and dissatisfaction; has done away with time killing tactics; has reduced the waste of raw materials and labor turnover; and, finally, has secured bigger pay for labor and bigger profits for capital.

The Rockefeller Plan is somewhat similar in nature to that of the Whitley Council, save that it is constructed from the bottom up. The system is in successful practice in the Standard Oil Company of New Jersey, the Colorado Fuel and Iron Company and in many other organizations. The following excerpts have been taken from an address delivered by John D. Rockefeller, Jr. before the War Emergency and Reconstruction Conference of the Chamber of Commerce of the United States, December 5, 1918.

> The outstanding features of this plan of industrial representation are as follows:
>
> Representatives chosen by the employees in proportion to their number, from their fellow workers in each plant, form the basis of the plan.
>
> Joint committees, composed of equal numbers of employees or their representatives and of officers of the company, are found in each plant or district.
>
> These committees deal with all matters pertaining to employment, and working and living conditions, including questions of cooperation and conciliation, safety and accident, sanitation, health and housing, recreation and education.
>
> Joint conferences of representatives of employees and officers of the company are held in the various districts several times each year.

There is also an annual joint conference, at which reports from all districts are received and considered.

Another important feature of the plan is an officer known as the President's Industrial Representative, whose duty it is to visit the plants currently and confer wih the employees' representatives, as well as to be available always for conference at the request of the representatives.

The employees' right of appeal is a third outstanding feature of the plan. Any employee with a grievance, real or imaginary, may go with it at once to his representatives.

Further appeal is open to the aggrieved employee, either in person or through his representatives, to the higher officers and to the president.

If satisfaction is not to be had from the company, the court of last appeal may be the Industrial Commission of the State, the State Labor Board, or a committee of arbitration.

A further feature of the plan is what may be termed the Employees' Bill of Rights. This covers such matters as the right to caution and suspension before discharge, except for such serious offenses as are posted; the right to hold meetings at appropriate places outside of working hours; the right without discrimination to membership or non-membership in any society, fraternity or union; and the right of appeal.

Here, then, would seem to be a method of providing representation which is just, which is effective, which is applicable to all employees whether organized or unorganized, to all employers whether in associations or not, which does not compete or interfere with existing organizations or associations, and which, while developed in a single industrial corporation as a unit, may be expanded to include all corporations in the same industry and ultimately all industries.

There are many other schemes of employee representation—some seem to work well, some but indifferently, and others fail miserably. So far, no true underlying principles have been evolved. Nor does there seem to be any social level of workers to which employee representation is best adapted. One employment authority has suggested the two following reasons as the main causes of failure in a factory democracy:

1. "Because capital has gone ahead assuming that labor would be content with a democracy, the form of which was predetermined at the annual meeting of the board of directors of the corporation."

2. "Because employees who were to be benefitted were not sufficient students of their own problems to be able to cope adequately with the new conditions of a joint partnership which would become theirs on a well-defined, democratic basis."

The above two statements indicate the necessity of selling the idea of industrial democracy to employees. Permanent institutions are built up slowly, not created suddenly. Each tier should be firmly in its place before another tier is erected upon it. Employees must not only be convinced of the value of the new movement, but they must also be educated to carry on their part of it. They must be persuaded of the right intentions of management; they must understand the scope and limits of the plan; they must be interested in carrying it out. Without the above elements, employee representation will mean little to the average employee.

A well organized employees' association will contribute much to workers. They will be led to understand the complexity of managerial problems, and to have increased respect for the executive who "sits in his chair all day long and does nothing." They will learn how to exchange ideas clearly, and will develop a mutual respect for one another. Since there are group interests, leaders will be developed. Workers will derive a sense of worthwhileness from realizing that they are not only parts of a great organization, but that they are helping to guide the destiny of that organization.

There is a fairly well established procedure for the inauguration of employee representation, whatever its form. An analysis of existing cooperative activities should first be made to discover the possible bases for the new system, and the probable attitude of the workers toward a cooperative movement. As far as possible, the desires of the workers regarding various aspects of industrial relations should be determined. Such desires are not necessarily obtained from what men say, for too often higher desires are expressed in terms of the almighty dollar. The development of a plan suitable to a particular organization is a tedious task, and one in which all parties should have a hand. Study of existent methods will usually supply cues, but the order of development will necessarily differ in each concern. The next, and by far the most important task, is to sell the idea to employees so that they shall not only be willing, but eager, to undertake the responsibility involved. Education of workers in the new activities begins at this stage but must be carried on indefinitely. When the system is in good working order management must utilize it continually, thereby supplying a proper stimulation to the new order, and deriving the benefits from a better relation with workers' brains and hearts.

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CHAPTER XIV

RECORD KEEPING IN THE PERSONNEL DEPARTMENT

No personnel department can function to its greatest possible efficiency unless the system of record keeping is, in turn, functioning to its greatest efficiency. The chain is no stronger than its weakest link. Too often the importance of the filing system is overlooked.

Centralization of any filing system is merely following out a definite trend toward centralization and functionalization in all aspects of modern management. All records are at one place and maintained under a standard method. In this way related material is brought together. If decentralized files are handled by various clerks, they often must decide among themselves which clerk shall have a particular record. Accordingly each clerk, or his superior, will make sure that *his* files contain all information of value to him regardless of whether the records might be of greater importance to some other clerk or executive. Since the centralized files are in charge of one experienced clerk who devotes his entire time to the work, responsibility for correct filing is fixed, files are better kept, and papers removed from the files can more readily be checked out and in. Centralized files not only relieve desks of paper which may or may not be needed in the future, but they offer a ready, *known* location of all such records.

Not all personnel material should be put into the centralized files. Those files which afford information for one person only should be kept at the desk of that one person. Highly personal correspondence should never, of course, be kept in the centralized files.

The location of the area for the central files is often a perplexing problem. The most helpful rule to follow is that such location should provide the maximum convenience to those who use the files most. It is not necessarily true that files should be immediate to the office of the chief executive of the department. Certainly they should never be relegated to an obscure corner any more than should the telephone or the inkstand. All three give service.

The amount of space to be allotted to the central files will vary with the quantity of records to be handled, the number of clerks available and necessary for filing, and the frequency with which files are culled for inactive records. Plenty of space should be allowed for the growth of each file—it is better to overestimate this than to underestimate.

Probably the best arrangement of central files consists of the assignment of a rectangular area, around three sides of which files are located. Small individual desks or tables in the corners are preferable to a large center table. The latter causes many unnecessary steps in going from one side to the other and often permits confusion of records which have been carelessly placed upon it.

Rules and instructions governing the operation of the filing division should be issued by the personnel executive: such rules should be posted in a prominent place in the personnel department. Care should be taken not to make rules which cannot be enforced. Once formulated, rules should be strictly observed or else modified—otherwise they were better left unwritten. The following list suggests items that might be covered in such rules and instructions.

Instructions for Central Files

1. Responsibility
2. Methods of sorting, indexing and filing
3. Divisions of the files
4. Sources of material to be filed, and method of collection
5. Issuance of records
6. Return of records
7. Transferring and destroying of records.

A most important feature when a record is removed from a file is that a slip shall be inserted stating the name of the record and the name of the person who has taken it. In this way the file clerk can know just where every record is, and can pass responsibility to the proper person.

The term filing should not be confused with indexing. The former merely indicates the kind of receptacle or box in which records are kept. The latter has to do with indicating where any particular record may be found. The common box file, much used in the filing of correspondence, indexed alphabetically, is probably one of the most familiar types of file. Another common method is the vertical file in which the record is filed upright in folders or between index cards.

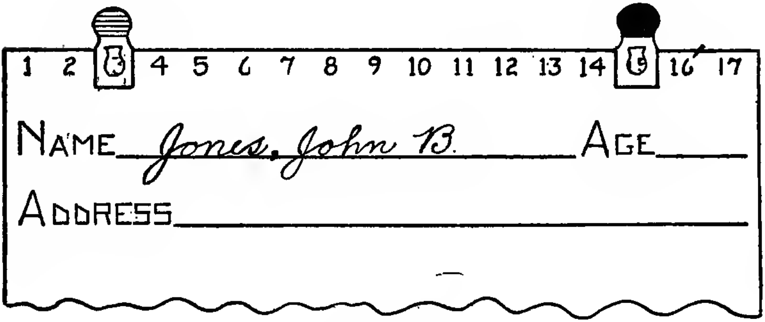
In practice, there are four main bases of indexing personnel records. The alphabetical arrangement is one of the simplest and the one most used. Often it is convenient to have a file of employees which is arranged in numerical sequence, according to the clock or job number of every employee. Or various departments or shops may be kept separate, and cards arranged alphabetically within each department or shop. The fourth basis of classification is to group all workers on a particular kind of work, although the jobs may be scattered over several departments.

Where personnel records are grouped under various indexing bases as indicated above, each file should, usually, form a cross-reference to the other files. For instance, the application blank and qualification card of each worker might be filed alphabetically; the medical record filed numerically; and the history or progress card filed by kind of work done. If a man's number is known, it is a simple task to find from the medical record his name and job; if his name is known, his number and job can be discovered; if his job is known, his department can readily be ascertained, etc.

There are of course, many other bases of classifying personnel records, and there are many possible combinations of the four cited. Almost any file may be subject to the further sub-division of live and dead, or active and inactive, records.

Indexing schemes are almost numberless, and each one, is according to its promoter, far superior to all others. It is the purpose of this chapter merely to present a few of the more common which have proven successful in personnel filing practice.

The signal tab index (vise index; flag index) was used with marked success in the Army personnel work, in which over three and a half million men were class-



NAME Jones, John B. AGE

ADDRESS

Figure 24

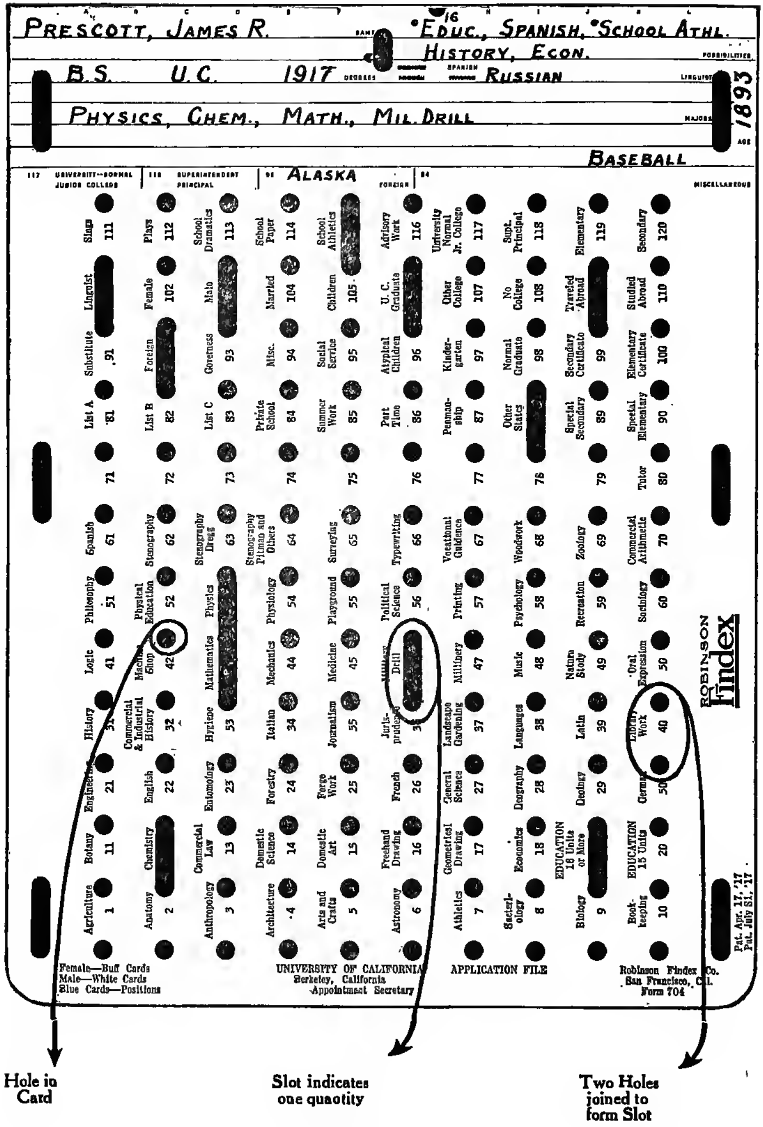
ified. As shown in the accompanying illustration (Fig. 24) signal tabs, or flags, are placed along the top edge of each card at various positions to indicate that certain kinds of information are contained on the particular card.

A further refinement of the signal tab device is to use different colored tabs for variations of the quality indicated. Thus, in the illustration the tab over 15 might mean that John Jones is a pipefitter; if the tab is green, that he is an expert; if the tab is yellow that he is an apprentice. There are many possible variations of this method.

When cards are being printed with the numbers along the top edge it is important that the space allotted to the number 1 be of equal width with that allotted to the number 24, etc. Another essential is that on each card the distance from any number to the edge of the card is the same. Otherwise, tabs on the same number will not appear in alignment when cards are filed.

The visible card index is really both file and index in one. This system uses special cards of uniform size arranged in vertical frames or panels, and held by means of hinges or projecting strips usually at the top of the card. Each card overlaps the one below, leaving visible a narrow strip which is the bottom of each card. Here is written the name or other designation by which the card is to be recognized. The panels are usually either vertical, or at a convenient angle for use on the desk, but some are inserted like flat drawers in a cabinet. In a variation of the system, cards are hinged at the bottom and the name is then visible at the top. It is also possible to utilize folders, leaving three or four sides available for recording purposes—no loose records can, of course, be contained in this folder.

The Findex system is one of the most advanced and most ingenious methods of crystallizing data on one card,



PRESCOTT, JAMES R. NAME 16 •EDUC., SPANISH, •SCHOOL ATHL.

HISTORY, ECON. POSSIBILITIES

B.S. U.C. 1917 DEGREES FRENCH GERMAN SPANISH RUSSIAN LINGUIST

PHYSICS, CHEM., MATH., MIL. DRILL MAJORS

1893 AGE

BASEBALL

117 UNIVERSITY—NORMAL JUNIOR COLLEGE | 118 SUPERINTENDENT PRINCIPAL | 91 ALASKA FOREIGN | 94 MISCELLANEOUS

Slags 111	Plays 112	School Dramatics 113	School Paper 114	School Athletics 115	Advisory Work 116	University Normal Jr. College 117	Supt. Principal 118	Elementary 119	Secondary 120
Linguist 101	Female 102	Male 103	Married 104	Children 105	U. C. Graduate 106	Other College 107	No College 108	Traveled Abroad 109	Studied Abroad 110
Substitute 91	Foreign 92	Governess 93	Misc. 94	Social Service 95	Atypical Children 96	Kindergarten 97	Normal Graduate 98	Secondary Certificate 99	Elementary Certificate 100
List A 81	List B 82	List C 83	Private School 84	Summer Work 85	Part Time 86	Penmanship 87	Other States 88	Special Secondary 89	Special Elementary 90
71	72	73	74	75	76	77	78	79	Tutor 80
Spanish 61	Stenography 62	Stenography Gregg 63	Stenography Pitman and Others 64	Surveying 65	Typewriting 66	Vocational Guidance 67	Woodwork 68	Zoology 69	Commercial Arithmetic 70
Philosophy 51	Physical Education 52	Physics 53	Physiology 54	Playground 55	Political Science 56	Printing 57	Psychology 58	Recreation 59	Sociology 60
Logic 41	Machine Shop 42	Mathematics 43	Mechanics 44	Medicine 45	Military Drill 46	Millinery 47	Music 48	Nature Study 49	Oral Expression 50
History 31	Commercial & Industrial History 32	Hygiene 33	Italian 34	Journalism 35	Jurisprudence 36	Landscape Gardening 37	Languages 38	Latin 39	Library Work 40
Engineering 21	English 22	Entomology 23	Forestry 24	Forge Work 25	French 26	General Science 27	Geography 28	Geology 29	German 30
Botany 11	Chemistry 12	Commercial Law 13	Domestic Science 14	Domestic Art 15	Freehand Drawing 16	Geometrical Drawing 17	Economics 18	EDUCATION 18 Units or More 19	EDUCATION 15 Units 20
Agriculture 1	Anatomy 2	Anthropology 3	Architecture 4	Arts and Crafts 5	Astronomy 6	Athletics 7	Bacteriology 8	Biology 9	Bookkeeping 10

ROBINSON Findex

Pat. Apr. 17, '17
Pat. July 31, '17

Female—Buff Cards
Male—White Cards
Blue Cards—Positions

UNIVERSITY OF CALIFORNIA
Berkeley, California
Appointment Secretary

APPLICATION FILE

Robinson Findex Co.
San Francisco, Cal.
Form 704

Figure 25

yet yielding these data readily in all possible combinations. A glance at the accompanying illustrations (Figs. 25 and 26) will make the entire system clearer.

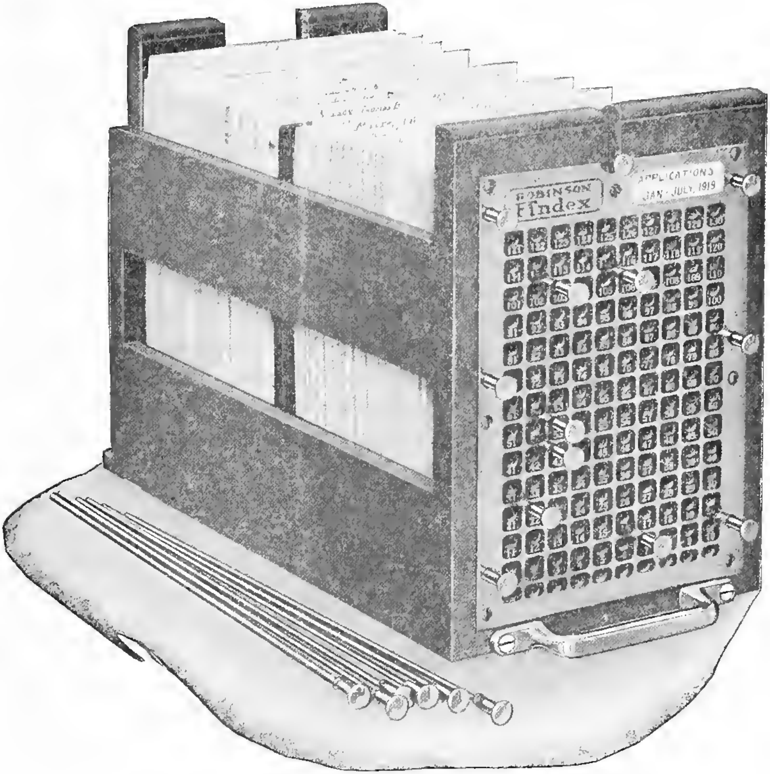


Figure 26

The slot cut between two holes (Fig. 25) indicates the presence of a certain quality, such as the fact that the individual understands chemistry, or is a linguist. To pick out cards which possess certain qualities, rods are inserted as shown in the second illustration (Fig. 26). The file is then turned over so that those cards which have had slots cut will protrude the length of that slot above the others. Protruding cards are then locked into position by the insertion of a rod through the small slot at the top and middle of each card, and the file turned upright once more. In Figure 26, six qualities have been demanded at once such as

1. Female
2. In selling division
3. Twenty years old or over
4. Speaks French
5. Knowledge of gowns
6. Familiarity with other departments[1]

Excluding the six permanent locking rods, and the single temporary locking rod, the illustration shows how six rods have been insterted to discover six items. Those cards which project above the others posses all six qualities.

The Findex system is useful chiefly in securing data from permanent records. The system can be adapted with difficulty to records on which cumulative data must frequently be entered, for the six locking rods must be pulled out before a card can be removed or inserted. The initial cost of the system compared with other systems is rather high, although not excessively so. Nevertheless, it seems fairly certain that this system for certain purposes is without equal, regardless of the cost, for service is the main objective.

The Hollerith sorting machine has come into great favor in the accounting departments of large organizations. A standard card similar to that shown in the accompanying illustration is used. (Fig. 27). In this system, a punch through a certain number indicates a point of information. Each column is devoted to the consideration of a particular quality. For instance, a column might be used to denote the color of the worker: 0 might might mean white; 1, black; 2, red; etc. Or two columns might be given over to the date of birth: 00 might then mean 1900; 97, 1897; 02, 1902, etc. It can readily be realized that it is necessary first to devise a code before items can be punched on the card.

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[1] The author is indebted to the Robinson Findex Company for permission to use material and illustrations of the Findex system.

Cards are placed in the sorting machine and separated at a rapid rate according to one quality at a time. If it were desired to discover all negroes born in 1900, the cards would first be sorted by the column which indicated the color of workers, and then the cards of negroes would be sorted for 0 in the unit's column, then for 0 in the ten's column. Using, say, five hundred cards, these three operations would consume perhaps five minutes time.

For statistical grouping according to any item listed on the card, the Hollerith sorting machine is unexcelled. A minor improvement is an attachment which automatically counts the cards in each group as the machine sorts them. The human equation in the process is almost negligible. Furthermore, an electric tabulating machine is available to supplement the sorting machine so that quantitative data like wages can be readily computed for each subdivision, and for the group as a whole, all in one process. Both the sorting and tabulating machines are well adapted to the needs of personnel and

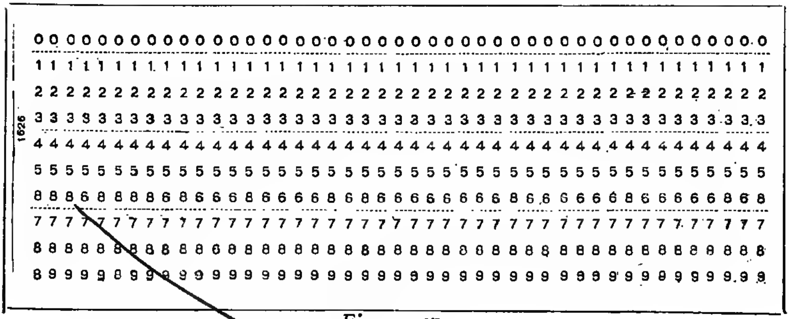

Figure 27

other departments of plants employing a thousand men or more. It is to be regretted that machines cannot be bought, but can only be rented.

Before ordering records of any size whatever, the proposed dimensions should be checked against the standard sizes. This precaution may save the unnecessary expense of having special filing cabinets made to order. The following list indicates the standard sizes of cards most in use.

STANDARD SIZES OF CARDS FOR FILING.

Height	Width
3 inches	2¼ inches
3 "	5 "
4 "	6 "
5 "	8 "
6 "	4 "
8 "	5 "

When the filing system for the personnel department is being selected, certain broad criteria should be noted. The physical limitations of space, the money available, and the probable clerical assistance must all be considered, for these factors may readily limit the ideal possibilities. Provision should be made for increases in the number of records, and for possible new records. These ends may be accomplished by mere allowance of filing space, by reference index to records stored elsewhere, or merely by periodic "housecleaning," without the reference index—the records so secured to be either stored in bulk or destroyed. Whenever possible, all data on one individual should be collected at one place. The seriousness and difficulty of changing an established filing system should be realized at the very beginning rather than later.

The personnel record section should be functionalized under a responsible head, who should be given authority commensurate with his responsibilities. Filing can very well be placed under the research director for much of his work will be concerned with data in record form.

Records should, to quote Mr. Harrington Emerson, be "immediate, reliable, permanent and adequate." The last of these four requirements—adequacy—must be given careful forethought, not only in the devising of the individual record, but also in the selection of the method of filing and indexing. If a record on which dozens of entries must be made daily is contemplated, it would naturally be highly inefficient to have such record made of flimsy stock, or to file it away in the old type correspondence box file. If foresight is to be better than hindsight, to reverse the old adage, each record contemplated should be subjected to a preliminary analysis. The following list is offered as suggestive of items which should be considered in planning personnel records.

Preliminary Analysis of Personnel Records

1. Where does the record originate?
2. What information should it contain? What are the sub-divisions and arrangement of this information?
3. Is the information on any other record or records? Is this record necessary?
4. Are the data permanent, as on the labor requisition, or cumulative, as on the progress card?
5. Will the information be desired frequently? How often?
6. Once filed, who will handle the record?
7. Do the data lend themselves to signal tabs; to Findex; to Hollerith; to visible filing; etc.
8. How small can the record be, yet fulfil other requirements? What standard size shall be used?
9. What shall be the indexing basis: alphabetical, numerical, departmental, etc. Why?
10. What cross-references, if any, are necessary?
11. What are the initial costs of contemplated systems? What will be the probable relative costs of upkeep per year?
12. Are contemplated costs and upkeep compensated by necessary increased service and efficiency?

The accompanying table (Fig. 28) should prove of assistance in making initial choices, for it paves the way to the selection of particular filing systems.

KEEPING A RECORD OF THE INDIVIDUAL WORKER

Status	New Working			Former Employee		Application pending or rejected	
Information desired	Identity: 1. Personal 2. Job	Abilities	Value to Organization	Identity Abilities Value to organization	Availability	Identity	Availability
Records of items which afford desired information	Application blank: 1. Job assignment 2. Clock number Medical record Photograph References	Application blank Mental and skill test records Interviewer's rating Training records	History card: 1. Attendance 2. Lateness 3. Production 4. Bonus 5. Errors 6. Discipline 7. Accidents 8. Ratings 9. Transfers 10. Promotions	References Application blank Medical record Photograph Test records Training records History card	Quit Slip	References Application blank Medical record Test records	Application blank Medical record
Nature of data	Permanent	Permanent	Cumulative	Permanent	Permanent	Permanent	Permanent
Method of filing	Either permanent and cumulative data kept in one place Or permanent and cumulative data kept seperate			All merged into one file			

Figure 28

In common with practically all record keeping systems, that of the personnel department will be concerned with both permanent and cumulative data. These terms should not be confused with permanent and cumulative files. In that records are constantly being added, nearly all personnel files are cumulative files—that of personnel specifications is a possible exception. Under the heading of permanent data records would be included the application blank, the interview blank, the medical record, test records, requisitions, personnel specifications, training records after the training period, reports of turnover, etc. The foregoing would change but slightly, or not at all, in content. Under cumulative data records might be noted those of absence and lateness, reports of investigators, transfers, promotions, records of men in training, records of production and efficiency, rejections by inspectors, disciplinary measures, awards, periodic ratings or examinations, accidents, transactions with cooperative stores, pensions, insurance, and dozens of others.

The chief use of permanent data records in the personnel department, after their initial purposes have been served, is to afford individual or group information which held previous to employment. It may be necessary to discover whether Tony Mascolo has been naturalized—a bit of individual information. Or the pipes in the shop may have burst and the works manager want immediately the names of all men in the plant familiar with pipefitting—such would be group information.

The main purpose of cumulative data records is to provide a ready means of recording important variable items, chiefly those concerned in the follow-up and promotion of each individual worker. The graphic progress chart shown in a previous chapter is typical of the cumulative record.

The accompanying table (Fig. 29) indicates the various steps necessary in selecting the filing system for the personnel department and is the natural sequence to the preceding table. "Nature of Data" indicates a listing of the items which are to be recorded for each worker. "Distribution of the Data" necessitates the decision as to whether permanent and cumulative data shall be kept separate or together. "Form of Record" means the choice of one or more types of record (card, envelope, folder, etc.) for various purposes. "Further Distribution of Data" involves the placing of the essential items on the form of record chosen. "Some Possible Filing Methods" suggests the last decision in the choice of a personnel filing system.

In actual practice one cannot decide step by step so readily as the table might indicate, for the steps are often interdependent. It is to be regretted, however, that too often the process of selection functions in exactly reverse order: the personnel manager is sold on a particular filing system, and fits his records to it.

The sales promoter of a filing scheme can seldom be depended upon to state the weakness of his particular system—and catalogue pictures often are exceedingly attractive.

It is probably impossible to formulate a system of records and record keeping which is the ideal system for every personnel department. But known principles can be laid down, and pitfalls pointed out. Thus, by profiting from the experiences of others, the personnel manager is assured of a solid foundation on which to install the filing system for his department.

Steps in Choosing the Filing System for the Personnel Department

Nature of data	Records containing permanent and cumulative information								
Distribution of data	Both permanent and cumulative data kept at one place				Permanent and cumulative data separate				
					Permanent data			Cumulative data	
Form of record	Card	Envelope	Folder		Card		Envelope or folder	Card	
Further distribution of data on records	All data kept on a single card	Permanent data on outside of envelope. Cumulative data records and other records contained in envelope.	Permanent data on outside of folder. Cumulative data records and other records contained in folder.	Permanent data recorded on inside of folder. Cumulative data recorded on outside. Other records inside folder.	All permanent data on one record card	Permanent data on various cards filed separately	All permanent data written on or contained in envelope or folder	All cumulative data on one card	Cumulative data scattered over various records filed separately
Some possible filing methods	Vertical file Signal tabs Visible card index	Vertical file Signal tabs (?) Visible card index (?)	Vertical file Signal tabs (?)	Vertical file Signal tabs (?)	Vertical file Signal tabs Visible card index Findex Hollerith	Vertical file Signal tabs Visible card index	Vertical file Signal tabs (?) Visible folder index (?)	Vertical file Signal tabs Visible card index	Vertical file Signal tabs Visible card index

Figure 29

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CHAPTER XV

PERSONNEL RESEARCH

Recognition of the value of personnel research is bringing about a crystallization of the division of research in the personnel department. A great telephone and telegraph corporation spends ten million dollars annually on research, and supports a technical staff superior to that of any technological institute in the country. By these means this company has been able to improve its service, pay higher salaries, yet has raised its rates very little indeed.

Mr. Harrington Emerson, in the preface to Twelve Principles of Efficiency, asserts that "It is *ideas* that create wealth. . . . . One single idea may have greater value than all the labor of all the men, animals and engines for a century." The case for research of any nature could not be presented more strikingly. The silent testimony of hundreds of our large corporations is overwhelming; we must conclude that research pays. Before we attempt to discover the possibilities of research which deals with the human element in industry, let us first realize the enviable position which has been accorded to that research which deals with materials.

The invasions of science into industrial life have created profound changes. Most of the great corporations of the United States have awakened to the value of research and do not hesitate to invest great sums for the maintenance of well equipped laboratories. In five years 50 companies found it profitable materially to increase their research departments; increases of from 100 to 500 per cent. were exceedingly frequent. The executives of these companies knew from previous experience that properly conducted research campaigns were almost certain to yield to the company many dollars of future profits for every dollar spent in investigation.

The concern which is first to appreciate the value of the scientific solution of its many problems stands to gain a great lead over its less keen competitor. Competition is the great lever which, balanced on the fulcrum of commodity prices, forces scientific research into the industrial organization.

The research department represents the functionalization of the ability to investigate a problem scientifically and impartially and to accept or reject results with equal willingness. The principle of the division of labor which is so well understood in connection with manual operations is being applied to service and administrative functions.

We are coming to realize more and more that the art of management consists not so much in the proper handling of materials as in the proper direction of men. If this is so, then research activities should follow the trend of managerial interest and so should be directed toward the solution of various "man problems" and toward the establishment of definite principles for the understanding and control of human behavior in industry.

A division of personnel research offers to industry of today as great possibilities as the industrial research laboratory twenty years ago offered to those concerns which now are the leaders in their respective fields. Just as the methods of the chemical laboratory have been carried over into industry, so we may expect and hope that the methods of the applied psychologist and of the physiologist will become accepted industrial practice. The trail has already been blazed. In a few universities we find pioneer bureaus of personnel research, of salesmanship research, of training research; in a few forward looking companies we find departments of sales research, trade extension, and occasionally one of personnel research.

Any problem may be handled by one or more of the following methods:

1. By disregarding it.
2. By decision based on experience (intuitive judgment).
3. By trial and error.
4. By scientific study.

The superiority of each method over the preceding is obvious. Having executive problems decided by research conforms to the exception principle of scientific management, which demands that only those problems that cannot be decided by subordinates and that procedure which is out of the ordinary should be brought to the attention of the executive. If the methods of science can still further lift the burdens of the executive, he should certainly welcome them.

What are the aims of a division of personnel research? These might be briefly enumerated as follows:

1. To bring to bear on all problems which are concerned with the relation of the worker to his work and to his company those findings of science which will result in a solution that shall be socially sound and industrially economic.
2. To afford cooperation between the numerous outside agencies such as educational institutions, government bureaus, current literature, etc., and the plant per-

sonnel, so that the findings of others may not be lost to the concern but may be made an immediate source of improved efficiency and contentment.

3. To find, develop and train men who can handle the various personnel activities according to the scientific methods in which they have received training.

4. To collect and interpret data, to publish the results and to secure general approval of the research program.

5. To appreciate the problems and crises of the future and either to avert them or to solve them before they occur.

Unless it belongs more logically to the work of some other division, any factor which affects the working force directly or indirectly would fall within the possible scope of the personnel research division. One of its important functions is to cooperate with outside agencies and to keep in touch with outside movements in order that the discoveries of others might be immediately applied to the problems of the particular organization. Recent books and magazines should be systematically reviewed. The research publications of federal, state, civic, professional and private institutions should be studied carefully. The research director will receive constant stimulation in his work by undertaking to keep in touch with other related movements.

The actual research studies of the division can readily be divided into two classes: those which are, and those which are not, under direct control of the company.

The personnel audit, or inventory, is a problem which falls under the former class. It should include a charting of the entire organization; collection of statistical facts about the personnel such as age, sex, nationality, number on each kind of job, average wage rates, etc.; a study of working conditions; methods and adequacy of pay; turnover analyses; attitude of management and method of control; attitude of workmen and their participation in management, if any; public, state, and federal influences; and finally, recommended improvements.

The job analysis is a natural sequence to the personnel audit and indeed might well be made simultaneously with it. The general steps in the job analysis are usually as follows: classification of all jobs; analysis of each job and its man requirements; grouping of similar jobs under similar titles; standardization of wage rates and establishment of lines of promotion; and finally the compilation of permanent job specifications.

The personnel audit and job analysis are but preliminary surveys. The process of selection, with its necessary uncovering of sources of labor supply demands constant attention from the research director, for it is one of the vital spots in personnel organization. Standardized interview blanks and carefully trained interviewers are all too few in the employment process of to-day. The devising of methods of rating and of mental and trade tests is a technical science in itself and one which offers demonstrable returns to the progressive concern.

There is much confusion as to just what part tests of intelligence and skill can play in the selective process. Grouping them together under the one general heading of mental tests, it is a fair statement to say that they cannot *unfailingly* predict success or non-success on the job, they cannot give absolute vocational guidance, and they cannot (so far) measure emotional or spiritual qualities. But mental tests can reveal a man's intelligence level, they can measure acquired information and skill, they can detect the presence of many special abilities such as rhythm, finger dexterity, etc., and they often can give negative vocational guidance, i. e., can warn an individual against attempting certain lines of work.

Some of the findings of the Committee on Employment of the National Association of Corporation Schools (1919 report) are of interest in this connection:

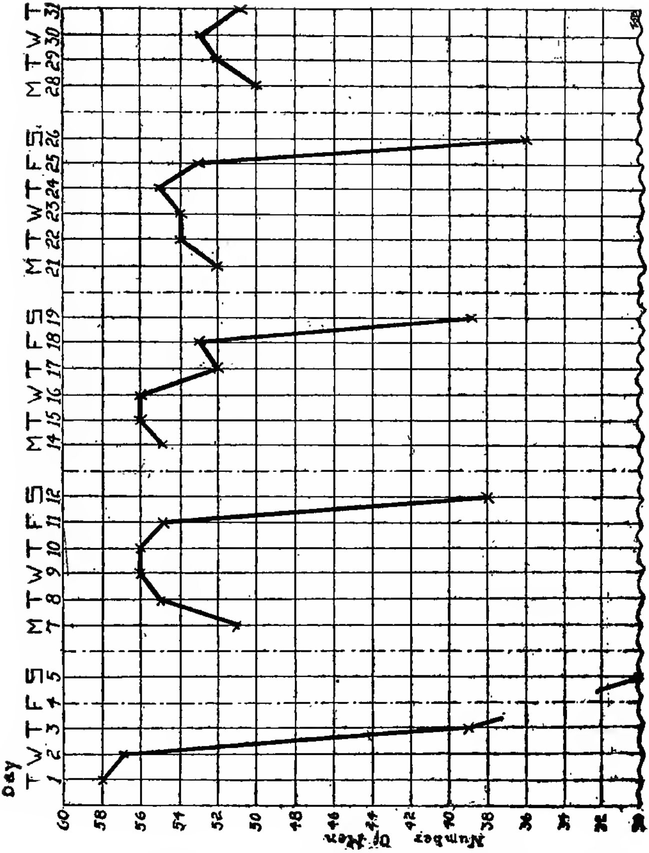
1. The purpose of psychological tests is conservative and the technique of developing and applying them is sound.

2. The number of instances in which tests have been successfully applied warrants the belief that they can be extended to other industries.

3. The success of any particular attempt to apply tests depends largely upon the seriousness and thoroughness with which it is made.

The maintenance of the working force is, of course, one of the big problems of the personnel department and is therefore a problem which challenges the attention of research. Probably one of the greatest needs in the personnel field to-day is for adequate measures of production. This is certainly not a need that can be solved by guess, and the trial and error method is usually rather costly. Establishing proper measures of production is a question that demands the best methods that science can offer for its solution. Studies of conditions that have been passively accepted, such as regular absenteeism, will often startle by their obvious significance. The accompanying Figure 30 indicates actual attendance conditions in a shop of one of our large corporations. It was calculated that the absenteeism limited the possible efficiency of this shop to 91 per cent.

Again, studies of accidents will usually reveal facts



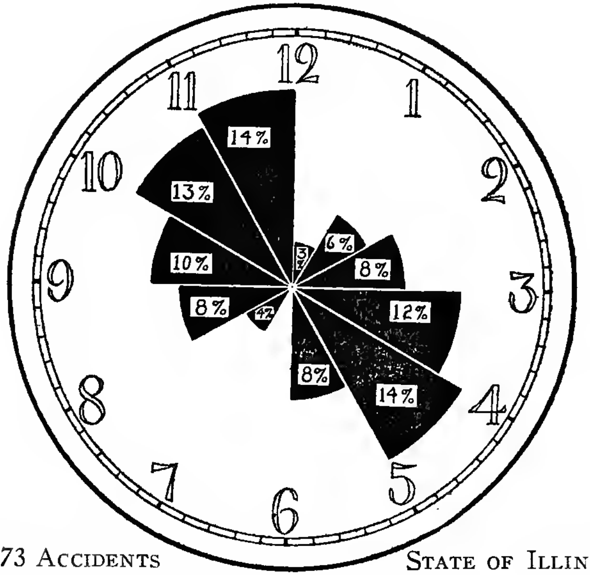
Daily Attendance, Blacksmith Shop, July, 1919.

Figure 30

such as indicated in Figure 31, thereby opening up great possibilities for the study of fatigue and accident prevention.

Training programs are usually evolved by the trial and error method. Those who install them seldom have the time or the inclination to consider closely the errors and successes of others, and so institute what they feel to be adequate. Much time, effort and money might be saved by the gradual building up of a training course

PERCENTAGE OF ACCIDENTS EACH HOUR OF WORKING DAY



1873 ACCIDENTS IN ONE YEAR

STATE OF ILLINOIS

Figure 31

which is based on the experience of others and on the definite contributions of science. In a similar way contemplated social and recreational activities would profit materially by a careful study as to the possible developments, the best methods of organization to fit the circumstances, and a proper regard for evolution rather than blanket installation.

In every business there is need for an honest viewpoint. Workmen and even executives who see opportunities for betterment will keep quiet because they feel that their suggestions might be resented. A personnel research division could make and stimulate suggestions, and could frankly analyze situations of lessened morale. A study of the latter involves a broad understanding of the instinctive and emotional promptings that so often motivate human acts.

So far we have considered only factors which are under the control of the plant. But there are many outside conditioning factors which warrant the attention of the research director because of their possible influence. The cost of living in relation to community living standards is probably the most important, for these affect the vital question of wages. It is no simple task to arrive at accurate conclusions concerning the cost of living in any single community—the national figures published by the Department of Labor are suggestive but cannot be used directly for this purpose. A chart similar to that in Figure 32 should prove illuminating to the management which believes in the fair deal.

Company Percentage Increase in Cost of Living Wages and Salaries

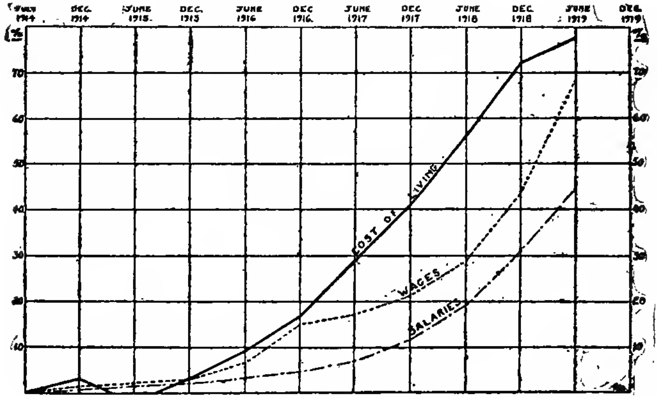


Figure 32

A survey of the educational and recreational opporits workers, will always afford valuable data to the concern which stands ready to utilize such information.

Analogous to studies of community conditions would be one of the sales territories covered by the company salesmen, for there are many points in common. The director of personnel research would be well equipped to carry on such an analysis for the sales department. The research director must always be prepared to defend with cold hard facts the various conclusions and recommendations which he may make.

The organization of the personnel research division is a relatively simple matter. Its size will, of course, depend upon the size of the plant and the intended scope of the research work. Every company comprising a thousand men or more will find it profitable to utilize the full time of a research director and a few assistants.

In selecting the research director, the accompanying personnel specification might prove helpful. It should be borne in mind that at the present stage of personnel work and of applied psychology, there will probably be no one who can meet all of the requirements set forth in this specification. The field of applied psychology offers at present the best trained men for personnel research. Any company will do well to engage a man who possesses the desires and potentialities rather than to wait until the director par excellence can be found. The author heartily endorses the statement of C. S. Duncan in his book on Commercial Research that "The first requisite for research work is a knowledge of statistics."

If the general manager is willing to face frank presentation of facts, the research director should be directly responsible to him. Such higher connection makes the manifold activities of the research director less difficult of execution for he can more readily carry on his work over the entire company. Furthermore, it enables the general manager to keep his finger on the pulse of the personnel situation as he could not do either by observation or by reading routine personnel reports. If the personnel manager is a man of vice-president calibre and one in whom the management has absolute confidence, perhaps responsibility should be to him rather than to the general manager.

PERSONNEL SPECIFICATION

PAYROLL TITLE Personnel research director

SYMBOL PRD

IMMEDIATE SUPERIOR General manager

NUMBER OF SUBORDINATES 4

DESCRIPTION OF JOB DUTIES

Directs all research pertaining to problems of the company personnel. Analyzes fatigue, absence, turnover, lessened morale, etc. Studies community living conditions. Devises measures of production, tests of selection and methods of rating. Makes available findings from outside sources and suggests improvements in existent personnel methods. Makes job analyses and periodic personnel audits. Helps in development of training program and trains assistants to scientifically direct various personnel functions. Directs and is responsible for the central files of the personnel department. Conducts publicity of results to secure further cooperation. Has advisory functions only.

NATURE AND CONDITIONS OF WORK

Mostly office work, but may be field. Necessarily varied and detailed.

MAN REQUIREMENTS

Physical—Average office type of physique, capable of prolonged intensive work occasionally; adaptable to both office and plant conditions.

Mental and Social

Intelligence—Superior—"A" or "B"

Education—At least a college graduate. Should have specialized in psychology, economics, engineering or education. Should understand the statistical treatment of variables: correlation and regression coefficients, multiple correlation, etc.

Temperament—Original, enthusiastic, persistent, directive, candid and accurate in deductions.

Social Qualities—Congenial, tactful, sympathetic, convincing.

Experience—Active personnel work; university or government research; general administrative work.

There are many preliminary considerations which must be faced before the establishment of a personnel research division. The estimated cost of salaries, printing and equipment for the first year can be roughly made. But it must be realized that many problems will prove expensive in the solution—it were better not to attempt these at all than to accept inexpensive surface findings. However, it should be remembered that most of the problems which the research department undertakes to solve would have to be decided in any event. Perhaps the unseen cost of a neglected evil or a wrong decision might be far greater than the investment in a careful study.

The problems of the personnel research division are primarily problems of group working and organization, and not those of the cloistered laboratory. There is much conservatism to be overcome, and findings should be applied very gradually. The usual experience in attempting to "sell" research of any nature has been that the newer industries accept it more rapidly than the older, and more complacent industries.

We may summarize the needs of the personnel research department as follows: adequate equipment; the facilities of the entire plant; cooperation of management, foremen and men; competent director and assistants; careful records; and a sentiment in favor of the research program.

The procedure of the research division may readily be divided into four parts:

1. Selection of the scope of activities and subsequent definition of each problem.
2. Planning for each individual problem.
3. Execution of plans, having various phases handled by experts.
4. Interpretation of results without bias.

The use of statistical method is one of the most important aids of the personnel research director. The mind is unable to grasp the significance of larger facts or underlying principles involved in a mass of data. Statistical procedure reduces a potpourri of separate facts to a unit statement which the mind can readily grasp. Thus, to enumerate the salaries received by sixty-six ledger clerks would fail to give the same idea as that conveyed by the simple statement that the average monthly salary of the ledger clerks was $95. We are already familiar with such terms as "average," "range," "per cent.," etc., but there are dozens of terms and dozens of formulas just as valuable which make understanding of intangible factors possible.

From the collection of many data there can readily be determined standards of attainment by which to value and to guide current performance. These are essential to adequate measures of production.

One of the biggest possibilities which the science of statistics offers industry is the method of measuring relationship between two seemingly disparate factors. Suppose we want to measure how well a trade test is selecting men for a certain position. We can plot the relationship between the test and actual performance as shown in Figure 33. It is very evident that those who made high scores in the test also made high records of production, with the one exception, M, who made high in the test but was only an average producer. But in order to compare the value of this test with some other test for the same purpose, there is needed some simple measure of relationship, and this is supplied by what is known as the coefficient of correlation, obtained from the application of mathematical formulas. Correlations may range from plus 1.00 to minus 1.00. A plus 1.00 correlation would mean that the best man in the test was the best producer; the second man in test standing the second in production. A zero correlation would indicate the absence of relationship between two factors. A minus 1.00 correlation would signify that the best man in the test was poorest in production, etc. The value of the

COMPARISON OF TEST SCORES AND PRODUCTION OF 20 WORKERS

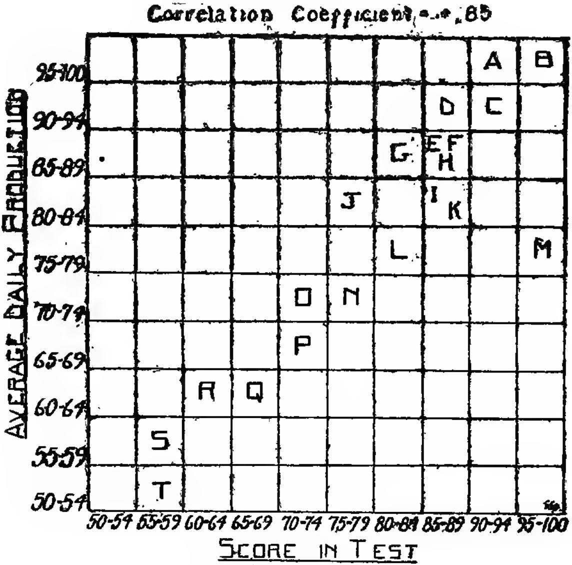


Figure 33

correlation coefficient in conveying an idea which is otherwise difficult to state is evident.

In the group of twenty workers shown in the accompanying figure, worker M should be observed carefully, for there is something which prevents him from producing to his probable capacity.

In similar manner it is possible to measure the relationship existing between three or more variables, as Taylor did in his work on the laws governing the proper cutting of metals. Perhaps no one contribution has affected industry more than Taylor's work in this one field, yet there are scores of such laws awaiting those who have the ability, patience and faith necessary to reveal them.

Graphical presentation of facts is a great adjunct to statistical procedure, for it substitutes pictures for words. How long would it take one to present verbally the data which are shown on the accompanying charts?

Finally it must be realized that statistical results and their graphic presentation can only justify themselves if they are used in making new decisions, planning new policies, adopting new methods. Statistical records which are made simply for filing purposes are comparable with fine clothes which are never worn—both take up valuable space and soon become out of date.

The invasion of research into the field of personnel has deep significance. Sooner or later there will be built up a mass of underlying principles for the conduct of personnel work. Science in industry has constantly meant the improvement of methods and conditions, the lightening of the heavier burdens, increased production with lowered costs, larger salaries, shorter working hours, and a substitution of facts for beliefs.

Research has ever been the pioneer which points the way. Much is to be expected from its application to the greatest problem that industry has yet had to meet. The so-called opposing forces of capital and labor *must* become partners in production—this is the trend of all personnel work, this the trail which research will blaze.

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